

U.S. ARMY

**Center for
Army
Analysis**

**OPTIMAL STATIONING OF ARMY FORCES –
EXPANSION AND DEVELOPMENT**

(OSAF-ED)

SEPTEMBER 2002

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13. ABSTRACT (<i>Maximum 200 Words</i>) This project documents the updates of databases and algorithms required for the Optimal Stationing of Army Forces Model (OSAF) and examines several issues that might impact Army stationing decisions. This essentially serves as an extension of past Center for Army Analysis (CAA) stationing analysis (OSAF, CAA-R-01-42) and provides a reference for future analyses. Research topics include Government Accounting Office reports on lessons learned from past analyses, Federal Government Corporation possibilities, public-private-partnerships, industrial base opportunities, market valuations, and privatization. We document model updates, discuss each research topic, provide historical examples, and provide suggestions on the topics' impact on future analyses and Army stationing decisions.				
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OPTIMAL STATIONING OF ARMY FORCES – EXPANSION AND DEVELOPMENT

SUMMARY

THE PROJECT PURPOSE is to document the updates for databases and algorithms required for the Optimal Stationing of Army Forces Model (OSAF) and examine several issues that might impact Army stationing decisions. This essentially serves as an extension of past Center for Army Analysis (CAA) stationing analyses (OSAF, CAA-R-01-42) and provides a reference for future analyses.

THE PROJECT SPONSORS are the Assistant Chief of Staff for Installation Management (ACSIM).

THE PROJECT OBJECTIVES are to:

- (1) Increase the understanding of data and algorithms in OSAF.
- (2) Provide an understanding of several research topics and how they could influence Army stationing decisions.

THE SCOPE OF THE PROJECT

Topics include Government Accounting Office reports on lessons learned from past analyses, Federal Government Corporation (FGC) possibilities, Public-Private-Partnership (PPP), industrial base opportunities, market valuations, and privatization. We document model updates, discuss each research topic, provide historical examples, and provide suggestions on the topics impact on future and Army stationing decisions.

THE KEY ASSUMPTIONS - None

THE KEY LIMITATIONS - Time and level of expertise in some topic areas at CAA was limited; Price Waterhouse Coopers assisted with valuation and FGC research.

THE PRINCIPAL FINDINGS

- (1) General Accounting Office Base Realignment and Closure reports stress the reliance on auditable data and Joint analysis.
- (2) PPP, FGCs, and privatization may influence future Army stationing; to what degree is unclear.
- (3) There is a vast amount of literature on all researched topics that support both the pros and cons of each managerial approach.

THE PROJECT EFFORT was conducted by LTC William Tarantino, Resource Analysis Division, Center for Army Analysis.

COMMENTS AND QUESTIONS may be sent to the Director, Center for Army Analysis, ATTN: CSCA-RA, 6001 Goethals Road, Suite 102, Fort Belvoir, VA 22060-5230.

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1 OPTIMAL STATIONING OF ARMY FORCES – EXPANSION AND DEVELOPMENT (OSAF-ED)

1.1 Introduction

OSAF-ED was undertaken to document updates for databases and algorithms required for the Optimal Stationing of Army Forces Model (OSAF) and examine several stationing related concepts that might impact future Army stationing decisions. This essentially serves as an extension of past Center for Army Analysis (CAA) stationing analyses (OSAF, CAA-R-01-42) and provides a reference for future analyses.

The objectives include:

- (1) Increase the understanding of data and algorithms in OSAF.
- (2) Provide an understanding of how several research topics could influence Army stationing decisions.

We chose research topics based on their potential to provide lessons for future analysis and the potential to partially shift the facility or land burden of owning and maintaining facilities from the Army to the private sector, which would influence Army installation requirements. Topics include Government Accounting Office reports on lessons learned from past analyses, Federal Government Corporation (FGC) possibilities, Public-Private-Partnership (PPP), industrial base opportunities, market valuations, and privatization. We document model updates, discuss each research topic, provide historical examples, and provide suggestions on the topics' impact on future Army stationing analysis.

1.2 Key assumptions

None.

1.3 Key limitations

Time and experience with some topic areas at CAA was limited; Price Waterhouse Coopers & IBM Business Consulting Services assisted with valuation and FGC research.

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2 GAO ANALYSES OF PAST BRAC PROCESSES AND OUTCOMES

2.1 Introduction. This section provides a summary of major points from the General Accounting Office (GAO) reports that are related to Base Realignment and Closure (BRAC). The GAO published analytical reports that evaluate the military Services' conduct of past BRAC analyses completed in 1988, 1991, 1993, and 1995. During the last 10 years, GAO has also published other reports that reference or relate to the BRAC process. A complete listing of the reports that we reviewed is presented in the bibliography.

The table at Appendix D is a compendium of comments and criticisms from these GAO Reports¹ that specifically evaluate past Service BRAC processes. Appendix E is a synopsis of GAO comparisons of the military Services' BRAC analyses.

2.2 Past BRAC Analysis. BRAC analysis has matured from the first round in 1988, which essentially used whichever analytical factors might possibly impact the recommendations, to a more stringently defined set of factors defined by Department of Defense (DOD) for later BRAC decisions. Through each BRAC round the import of different factors became evident. For example, in 1988, local area economic impacts were influential, but, it was later determined that BRAC did not leave economic impacts at the level originally anticipated (GAO/NSIAD-90/42). Other issues emerged as being more significant than originally thought, such as the impact on utilities at receiving installations (GAO/NSIAD-90/42). In short, the Army (and other Services) learned more about conducting the analysis as it went through each of the BRAC rounds.

In the 1991 BRAC, the emergence of the Force Structure Plan and related DOD selection criteria signaled the beginning of DOD's attempt to more fully define the process that the Services used to conduct their respective analysis. Although DOD had made an attempt to be more of a player in the detail stages of the 1991 process, according to GAO, they still needed to do more especially in the area of fostering Joint use possibilities (GAO/NSIAD-91/224).

The GAO review of the 1993 BRAC process cited a 1991 amendment to the Defense Base Closure and Realignment Act requiring that persons who submit information to the Secretary of Defense (SECDEF) or the BRAC Commission "shall certify that such information is accurate and complete to the best of that person's knowledge and belief. SECDEF is responsible for enforcement. (GAO/NSIAD-93/173)." This gave DOD a greater influence in the Services' BRAC processes. The emergence of Defense Reform Initiative language in the 1993 report also signaled a new direction for future BRAC rounds. For example, selective sourcing initiatives such as taking advantage of cross-Service opportunities for common operations and functions were emphasized.

GAO first addresses the economic impact on municipalities in the 1992 BRAC and determined the economic impact of BRAC actions to be less dramatic in terms of the percentage of the

¹ GAO/NSIAD Report Numbers—90-42, 91-224, 93-173, and 95-133.

community losing their employment around these base closures than anticipated. For communities greater than 500,000, less than 3 percent was defined (Office of the Secretary of Defense (OSD), Office of Economic Adjustment) to be an acceptable impact; greater than 5 percent was an unacceptable impact (GAO/NSIAD-93/173).

The 5 percent threshold forced the removal of two installations from the BRAC list; GAO had the following observations about the local area economic impact assessment in their 1993 report (GAO/NSIAD-93/173).

“OSD applied an arbitrary cumulative economic impact standard that is not well supported.”

GAO’s recommendation: “Establish a supportable standard for assessing cumulative economic impact and review its process to make sure there is sufficient time to consider the results of these assessments. Such a standard would assist the Services in assessing cumulative economic impact.”

By the 1995 BRAC round (GAO/NSIAD-95/133), GAO was beginning to understand the economic aspects of base closures. For example, the unwillingness of civilian employees to relocate was originally estimated at 6 percent; however, GAO believed this value could approach 67 percent and determined a 1 percent rise in one-time costs due to a rise in severance pay, mitigated by a decrease in moving costs. For future rounds, GAO estimates a civilian placement rate of anywhere between 20-50 percent.

Despite initial expectations that economic impact assessments would play a larger role in BRAC 1995 than it had in prior rounds, this did not turn out to be the case, with the exception of actions by the Secretary of the Navy to exclude some bases from closure consideration due to the cumulative effects of prior BRAC rounds.

Also mentioned in the 1995 BRAC report were comments from the field on the growing burden of data collection and questions on the extent data were actually used in decision-making. Unfortunately, data requirements are burdensome but a reality. The analytical community can assist in this regard by ensuring data requests are concise and that enough time is provided to meet data requests.

Past GAO BRAC analyses can assist the Army as it prepares for the next BRAC. A critical view of GAO analyses will help the Army improve their overall analytical effectiveness, where simply repeating past analysis methodologies will prove limited if they are seeking additional insights. Common themes throughout the GAO reports are a reliance on auditable data, a movement towards Joint reviews, and the belief that BRAC has been successful.

3 PUBLIC- PRIVATE PARTNERSHIPS

One alternative installation structure (or augmentation) that the Army can use to meet its installation requirements is the Public Private Partnership (PPP)². This section provides a basis for the understanding of PPPs; additional information is in Appendix G.

A PPP is a collaboration between the Army and industry or local government for a defined period of time and related to one or more specific Army missions, i.e., a local community fire station could provide an installation firefighting support. Theoretically, a PPP may decrease the need for Army facilities because the private entity could provide the facility; cost implications need to be examined on a case-by-case basis.

3.1 PPP Characterization. The private partner has a predominantly commercial perspective whose primary interest in participating in a PPP is to obtain an acceptable return on investment. The private parties' risks are not only related to the financial return (which could eventually be guaranteed by the public authorities), but also to the insecurity of public policy and changing regulations. Both increase the uncertainty surrounding a PPP that gradually rises in relation to the duration of the project. In many cases, the private sector still avoids PPPs because the uncertainties are high compared to traditional collaboration forms between the public and private sectors. The Army might take advantage of PPPs to reduce large infrastructure costs or assist in base operations in some cases.

3.2 Proponents. Proponents of public-private partnerships stress the positive economic aspects to contracting out public services, which include the following.

a. Increased value of Army facilities through leases during peacetime when the production lines are underutilized. In wartime, the private firm would be contractually obligated to meet the Army's needs.

b. Building of commercial-type facilities by private firms through a leaseback arrangement whereby the Army keeps the facility and land in exchange for a share of the profits with the private firm.

c. Split research and development (R&D) costs on public-private joint ventures.

- Permits the Army to have an early influence on technology.

²The philosophical underpinning of those supporting privatization of public services is the belief that private companies will always outperform the public sector. Efforts to prove this notion rely on an unyielding faith in the capitalistic principles on which this nation was founded, unfettered by checks and balances. Accepting the possible validity of this argument over a period of time, how long can we expect the delicate balance required of public oversight and private enterprise to last? The Army needs to consider how long it will take until an all too comfortable relationship between the contractual parties, protected by a lack of further competition from other contractors, evolves into a nonproductive arrangement.

- Generates revenues that the Army can use for other research.
- d. Possibly a cost effective alternative to an installation closure.
- e. Army's motivation is to provide a service within a prescribed budget; corporation's motive is to provide services at a profit.

Proponents of public-private partnerships concede some negative aspects to the contracting out of public services:

- a. Legality.
- b. Public/political acceptance.
- c. Attractiveness to potential private partners.
 - Infrastructure (land leases) PPPs--unknown market demand for the collaborative entity's product and therefore the unpredictability of profits.
 - Intellectual Property PPPs--even more uncertain than infrastructure PPPs.
- d. Legal restrictions forbid the government from giving any single contractor a competitive edge over other contractors in the same line of business.
- e. Joint use of employees raises legal questions; therefore, the amount of cooperation that can occur in an organization where the civil servants have to stay unaffected by their contractor partners is debatable.

3.3 Critics. Critics of public-private partnerships cite some negative aspects to the contracting out of public services: the "Bell Report - 1962" (named after the Bureau of the Budget Director David Bell) addressed the "highly complex partnership among various kinds of public and private agencies, related in large part by contractual arrangements."

a. The panel perceived that the "cumulative" effects of contracting could be debilitating, for example the salaries of contractor employees were not capped, and over the long run, the knowledge that the government needs to control contractors might only be found within the contractors themselves.

b. Title 18, section 208 of the US Code provides for criminal sanctions for federal employees who work on matters in which they have substantial financial interests. These provisions do not govern the third party work force, nor are contractors currently bound to disclose most corporate matters relating to conflicts of interest or ethics.

c. In Lodge 1858, *AFGE v. Webb*, there was an apparent conflict within the National Aeronautical and Space Administration (NASA) Enabling Act, which provided that federal

employees would perform NASA's basic work, but capped their number, and then provided broadly for the deployment of contractors. The Court of Appeals observed that NASA "resorted to support service contracts as the alternative means of overcoming the civil service personnel ceilings."

3.4 Conclusion. In conclusion, PPPs are of interest to Army stationing analysts because the PPP can influence Army installation and facility requirements; supporters and critics abound in the public sector. Appendix G provides additional information on PPPs.

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4 FEDERAL GOVERNMENT CORPORATIONS

4.1 Introduction. What follows is a brief discussion on why Congress has traditionally established federal government corporations. The Army could use an FGC to possibly improve efficiency of industrial base operations, which could impact stationing requirements. The impact comes in the form of a lost requirement or responsibility for the activity placed in the FGC. Basically, the FGC would be responsible for all installation decisions that encompassed the activity. Resulting costs to the Army are not examined here and neither is their requirements to support the FGC; both would be addressed in the FGC charter.

A complete discussion of FGCs and Army application is at Appendix J.

4.2 Why FGCs? Why are FGCs created? Since 1945, Congress has usually created FGCs for one of four reasons: efficiency, political insulation, subsidy, and subterfuge³.

a. Efficiency. The classic reason given for creating an FGC instead of another type of agency is that an FGC will be more efficient at achieving a specific national goal, especially if the program envisioned involves market transactions. The national goal is ordinarily stated in the FGC's charter.

b. Political Insulation. Like independent agencies, FGCs allow Congress to insulate a program from the cabinet department that would normally have jurisdiction over it. Congress may feel that a small single-mission agency will be more zealous in furthering a given goal than a department in a multimission agency.

c. Subsidy. The eight privately-owned Government Sponsored Enterprises (GSEs) are a particularly effective means of delivering subsidies through the credit markets in that FGCs receive loans at lower rates than private corporations. While the US Government does not legally back the subsidies, the entities are treated as if there is an implicit guarantee.

d. Subterfuge. FGCs classified as either mixed ownership or private tend to be given "off budget" status. Once excluded from the national accounts, their borrowing is not counted as part of the official measure of the federal deficit. When Congress operates under spending caps or deficit reduction targets, pursuant to the Gramm-Rudman-Hollings budget reduction process for example, off-budget items are usually excluded from the official total "spent" by the government.

In "Reinventing the Government Corporation", Froomkin characterizes an FGC's liberty to abuse its powers as facing fewer practical or even theoretical constraints than comparable institutions. Because FGCs are federal, they are not subject to state regulation. Because FGCs are governmental, and often have special powers or access to cheaper capital, they are largely immune from market forces. As corporations, FGCs are exempt from most constraints ordinarily

³ Froomkin, A. Michael, "Reinventing the Government Corporation." *Illinois Law Review*. 1995 U. Ill. L. Rev. 543. Available at <http://law.miami.edu/~froomkin/articles/reinvent.htm>

applied to federal agencies. Self-financing FGCs can even evade Congress' power of the purse. A self-funding, self-perpetuating, profit-making corporation enjoys a degree of potential and perpetual independence unseen in most agencies.

Constitutional limits can apply to FGCs in either of two ways. If an FGC is considered public, then it shares a number of features with traditional agencies. A public FGC must be part of the Executive Branch of government. Therefore, a public FGC has to comply with rules imposed by the separation of powers that shape the Executive Branch's relationship with the Legislative Branch. Similar rules may also affect a public FGC's relationship with private stockholders.

In modern practice, the federal government has tended to take over only unprofitable activities, particularly railroads, from owners who for bankruptcy or other reasons, did not intend to maintain them and could not find another buyer. If an activity became profitable, it was usually sold off. Because the government ends up owning only unprofitable activities that it cannot sell, this policy has been dubbed "lemon socialism."⁴ (The converse of this observation could be that the private sector only takes over profitable ventures or ventures that the government has to ensure profitability, whether liable or not.)

4.3 Conclusion. In conclusion, FGCs are often viewed as a necessity to fill a gap in the private sector and are established when the required mission is commercial in nature, is potentially self-sustaining, or involves a large number of business-type transactions with the public. An FGC is created to be more efficient than a traditional government department, as an efficient form of nationalization, or as a preparation for eventual privatization. We discuss FGCs in detail in Appendix J.

⁴ Froomkin article "Reinventing the Government Corporation," <http://www.law.miami.edu/~froomkin/articles/reinvent.htm>

5 PRIVATIZATION

One strategic (strategic in terms of a far reaching impact) alternative to managing Army assets or requirements that impact the stationing of units that the Army could follow is the privatization of a unit's (military or government service employee) functions, which often places the responsibility to provide facilities on a government or private contractor. While stationing analysts typically would not be interested in privatization (decisions are made prior to stationing) a BRAC analysis would be interested due to possible implications; namely, the decrease in facility requirements that could impact a realignment or even a closure stationing alternative.

The literature is replete with commentary and examples of privatization, for example, Ms. Ann Markusen, in her January 2001 article entitled *The Case Against Privatizing National Security*, postulates that the appearance of periodical industrial depressions and the concomitant pressure to privatize since the late 19th century may now be a constant pressure due to two things.⁵ One, the permanent erosion of the industrial base in the private sector causing increased attention to the institutionalized industrial base in the DOD civilian sector and two, the movement toward a service sector economy wherein many of the service functions that have resided within the institutional Army are now widely available in the commercial sector.

The Army is also trudging through different initiatives that determine if an activity's functions can be moved to the private sector. Inherently Governmental functions include those activities that "require either the exercise of substantial discretion in applying Government authority or the making of value judgments in making decisions for the Government."⁶ An inherently Governmental function is so intimately related to the public interest as to require performance by Federal Government employees; which does not necessarily include a large portion of the Army workforce that performs commercial activities. A substantial percent of the Army's service support functions are performed by the private sector.

The use of commercial sources (or privatization of existing Army structure) does not necessarily weaken the Army's business operations in terms of the efficient and accountable use of resources based on best-value commercial practices. However, uncertainty can arise concerning the prospective view that a change in the current balance of how Army support services are accomplished will blur the distinction between inherently and non-inherently governmental functions. For example, the distinction between 'policy' and 'procedural instructions' is always at risk. Policy is the process of providing executive oversight involving the formulation of regulatory guidance not derivative of some other Governmental agency. Procedural instructions proceed from the conversion of policy into some level of documentation deemed usable by the support service personnel.

⁵ Ann Markusen, "The Case Against Privatizing National Security," *Governance*, June 2001. Available at <http://www.gao.gov/a76panel/fortherecord/amarkusenpaper.pdf>

⁶ OMB Circular A-76 (Commercial Activities), Revised 1999, Section 6. Definitions

We do not address privatization to the level needed to make stationing decisions in this venue, but we do provide a commentary on privatization that highlights some of the issues in the literature (See Appendix G).

APPENDIX A PROJECT CONTRIBUTORS

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APPENDIX B REQUEST FOR ANALYTICAL SUPPORT

P *Performing Division:* RA *Account Number:* 2001195

A *Tasking:* Verbal *Mode (Contract-Yes/No):* No

R *Acronym:* OSAF-ED

T

Title: OSAF Expansion and Development

1 *Start Date:* 01-Aug-01 *Estimated Completion Date:* 01-Aug-02
Requestor/Sponsor (i.e., DCSOPS): ACSIM *Sponsor Division:* DAIM-MD

Resource Estimates: a. *Estimated PSM:* 6b. *Estimated Funds:* \$0.00

c. *Models to be Used:* OSAF

Description/Abstract:

Define and expand the OSAF methodology in support of stationing analysis. To include updating data bases, incorporating environmental factors, and researching organizational efficiencies.

Study Director/POC Signature: **Original Signed** *Phone#:* 703-806-5446

Study Director/POC: LTC William Tarantino

If this Request is for an External Project expected to consume 6 PSM or more, Part 2 Information is Not Required. See Chap 3 of the Project Directors' Guide for preparation of a Formal Project Directive.

Background:

P

A

R *Scope:*

T

2

Issues:

Milestones:

Signatures *Division Chief Signature:* **Original Signed and Dated** *Date:*

Division Chief Concurrence:

Sponsor Signature: **Original Signed and Dated** *Date:*

Sponsor Concurrence (COL/DA Div Chief/GO/SES): **Original Signed**

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APPENDIX C BIBLIOGRAPHY**GAO Reports**

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"The Case Against Privatizing National Security." Ann Markusen, Senior Fellow Council on Foreign Relations, New York, NY.

"Public Purpose and Private Service: The Twentieth Century Culture of Contracting Out and the Law of Diffused Sovereignty." Daniel Guttman, Administrative Law Review, Washington College of Law, American University, Summer 2000, Volume 52, Number 3.

"Reinventing the Government Corporation," A. Michael Fromkin, Illinois Law Review, 1995 U. Ill. L. Rev. 543.

Extended Bibliography

Albright, Joseph W., COL. "Is There a Future for the Arsenal System? A Discussion of the Methodology for Determining the Viability and Efficiency of the Arsenal System." Strategy Research Project, US Army War College, Carlisle Barracks, PA.

Summary: This paper provides some rationale for the decision concerning continuing a government-owned government-operated arsenal system as well as considerations for determining how to make the arsenals significantly more efficient.

AMC-R 10-103. Department of the Army, Headquarters, United States Army Materiel Command. *Organizations and Functions: Mission and Major Functions of the United States Army Industrial Operations Command*. 6 May 1997.

Austin, Mike. "Managing the US Defense Industrial Base: A Strategic Imperative." *Parameters* (summer 1994).

Summary: Military planners falter when choosing between immediate operational capability and longer-term requirements. All the Armed Services have been sacrificing investment accounts since 1990 to maintain near-term readiness. In the absence of compelling warning indicators it is easy to rationalize loss of production capability that is perceived to be in excess of immediate needs. Our current emphasis on swift victory seeks to make a virtue of necessity, substituting speed for the reduced ability to sustain the force.

Beatty, William D. LTC. "Department of Defense, Inc.: Are We Ready to Become an Extension of Corporate America?" *U.S. Army War College*, Carlisle Barracks, PA. 7 April 1999.

Summary: The article summarizes the positive impacts that DOD may realize from privatization and outsourcing to effectively modernize and sustain support for the warfighter based on the guidance depicted in the OMB A-76 Circular.

Beuster, Alan. "Update on Industrial Base Concerns/Issues Presented to ICAP." PowerPoint Presentation, 12 February 2002.

Summary: Beuster, Chief of the AMSOS-PBI Industrial Base Assessment Division, summarizes the fragility of the of the ammunition industrial base due to decreases in production base capacity, loss of critical skills, increased start-up costs, minimal incentive for capital investment, and loss of surge capability.

Bienlien, Jay, MAJ. "Industrial Base Program Review and PBD 407 GOSC." 23 January 2002.

Summary: The purpose of this DAPR-FDL briefing was to provide the Industrial Base Program Review GOSC an update on the work completed to date and current status of PBD 407 and the Industrial Base Program Review.

Boezer, Gordon, Ivars Gutmanis, and Joseph E. Muckerman II. "The Defense Technology and Industrial Base: Key Component of National Power." *Parameters* (summer 1997).

Summary: The authors believe that without policy changes, the large reductions in defense research and development and procurement which began as the Cold War was ending, and are projected to continue, will result in a defense technology and industrial base inadequate to maintain US superpower status.

Borgeson, Douglas. "ARMS – Converting Industrial Facilities From Liabilities to Assets!" PowerPoint Presentation, AMSOS-CCM-E, 14 February 2002.

Borgeson, Douglas. "ARMS – Revenue Generation & Cost Savings Detail." PowerPoint Presentation, AMSOS-CCM-E, 14 February 2002.

Borgeson, Douglas. "ARMS Brief to LTC Tarantino." AMSOS-CCM-E, PowerPoint presentation. 14 February 2002.

Braman, Michael T. Major. "Privatization of Military Repair Depots." *Air Command and Staff College* (March 1997).

Summary: The article suggests that the lessons learned from the cutbacks in modernization and sustainment can be applied to the Defense Depot Maintenance through interservicing and privatization.

California Chief Executive Officers' Defense Privatization Task Force. Ed Dunford, Chair. *Pathway to Privatization – An Industry Perspective*. March 1996.

Center for Strategic & International Studies Washington D.C. "Defense Restructuring and the Future of the U.S. Defense Industrial Base." March 1998.

Congress of the United States, Office of Technology Assessment, OTA-ISC-500, NTOS order #PB91-220012. *Redesigning Defense: Planning the Transition to the Future U.D. Defense Industrial Base*. July 1991.

Summary: The article states that the current trends in the Defense Technology Industrial Base of regulatory controls and lack of any overall strategy to prepare for the future are largely unfavorable. These trends are forcing companies to follow strategies of survival rather than to position themselves for future business success.

Congressional Research Service, The Library of Congress, Ronald C. Moe, Specialist in Government Organization and Management, Government Division. *CRS Report for Congress, Federal Government Corporations: An Overview*. 24 November 1998.

Summary: Report states that there is little managerial oversight of government corporations as an institutional category by either the President or Congress. However, a major appeal of the government corporation option will remain the flexibility afforded by its ambiguity in law.

Congressional Research Service Issue Brief 92122. *Defense Industry in Transition: Issues and Options for Congress*. 9 January 1997. <http://www.fas.org/man/crs/92-122.htm>

Courter, Jim, L. Steve Davis, Loren B. Thompson. "US Military Ammunition Policy: Reliving the Mistakes of the Past?" *Parameters* (autumn 1994).

Summary: The article focuses on a single critical sector of the defense industrial base, the ammunition industry, and considers present plans for its consolidation in light of lessons learned from the Korean War.

Defense Reform Initiative, Office of the Secretary of Defense. "Chapter 3: Streamlining Through Competition." <http://www.defenselink.mil/pubs/dodreform/chapter3.html>. 10 January 2002.

Summary: Report asserts that competition is the driving force in the American economy. It forces organizations to improve quality, reduce costs, and focus on customers' needs. Competition offers benefits to DoD and will play a critical role in reform efforts.

Defense Reform Initiative, Office of the Secretary of Defense. "Chapter Five: Savings Through Eliminating Unneeded Infrastructure." 1997.

Summary: Report outlines a series of five initiatives aimed at cost savings through the elimination of unneeded infrastructure.

Department of Army, FM 100-16, *Operational Support*, Appendix A, The Defense Industrial Base.

Department of Army, FM 700-90, *Army Industrial Base Program*.

Department of Defense Directive (USD(AT&L)). *Subject: War Reserve Materiel Policy*. 9 November 2000.

Department of Defense, AR Today, Vol. 6, No. 2. *2001 Defense Reform Conference Call for New 'Action'*. May/June 2001.

Summary: The quote from Mr. Vance Coffman, Chairman and CEO, Lockheed Martin Corporation is notable. "No amount of money will buy time....we don't build weapons for today's threats, but for tomorrow's."

Department of Defense, Office of the Secretary of Defense Report to Congress. *Depot-Level Maintenance and Repair Workload*. March 1996.

Summary: The report states that the private sector wartime support of some mission essential systems and components can be assured with acceptable risk. The Department can and should increase its reliance on the private sector to reduce organic infrastructure costs and where possible, reap the benefit of competitive private sector support capabilities. Core capability requirements are derived from applicable Joint Chiefs of Staff contingency scenarios and requirements but are not overtly defined.

Department of Defense, *Policy Regarding Performance of Depot-Level Maintenance and Repair*. March 1996.

Department of Defense, William S. Cohen, Secretary of Defense. *Annual Report to the President and the Congress Chapter 16 Industrial Capabilities and International Programs*. 2000.

Summary: Current trends in the Industrial Base challenge DOD's ability to maintain industrial competition to facilitate cost and quality improvements and innovations. It discusses DOD's four major thrusts of the industrial strategy, which includes a section on "Right-Sizing in a Changing Environment".

Department of Defense. Defense Science Board Task Force. *Preserving a Healthy and Competitive U.S. Defense Industry to Ensure our Future National Security*. Final Briefing, November 2000.

Summary: Summarizes in detail the state of the traditional defense industrial base, stating that many companies face challenging problems, including limited growth potential, declining profitability, decreased cash flow, increased debt with debt/equity ratios so high as to lower their credit ratings, significant losses in market capitalizations.

Department of Defense. *Munitions Action Plan: Maintaining Readiness through Environmental Stewardship and Enhancement of Explosives Safety in the Life Cycle Management of Munitions*. Operational and Environmental Executive Steering Committee for Munitions (OEESCM), November 2001.

Summary: Most munitions acquisition programs specify performance parameters and leave material selection and other design aspects to the discretion of the contractor. This approach leaves the resultant "environmental ramifications decisions" to the contractor as well. Performance specifications, administered by acquisition managers, would help reduce the environmental impacts of munitions over their life cycle.

Department of Defense. *Program Budget Decision, PBD407*. 28 November 2000.

Department of the Army for the Vice Chief Of Staff Of The Army. *Ammunition Program, 2000*.

Department of the Army, U.S. Army Cost and Economic Analysis Center. Memorandum for the Assistant Secretary of the Army, Research, Development and Acquisition. *Subject: Economic Analysis of the Armament Retooling and Manufacturing Support Initiative Economic Benefits to the Army*. 30 September 1996.

Department of the Army. U.S. Army Audit Agency. *Report on the Audit of Reforming Ammunition Procurement – Phase II*. 27 August 1998.

Deutch, John. "Consolidation of the U.S. Industrial Base." *Acquisition Review Quarterly* (fall 2001): 137-150.

Summary: The article asserts that, given the likely level of defense expenditures over the long term, the health of the U.S. defense industry depends on reducing the asset base devoted to defense by both the commercial and government sectors.

Defense Reform International. Darlene Druyun, Executive Chair. *A Blueprint for Action: Final Report*. 14-15 February 2001.

Summary: Report discusses the adverse impacts to the financial stability of aerospace and defense contractors over the past decade, their current state and what is expected in the near future.

Doherty, T.J., R.E. Rhoads, Pacific Northwest National Laboratory, Operated by Battelle for the U.S. Department of Energy. *Recommended Strategy for Configuring and Managing the U.S. Munitions Industrial Base*. April 1997.

Drayer, Dennis LT. COL, U.S. Air Force. "Performance-Based Business Environment: PBBE-A Business Vision We Can Live With." *PM* (January-February, 1998).

Executive Office, Office of Management and Budget. *Circular No. A-94 Revised*. 29 October 1992.

Farrell, Lawrence P. Jr.. "U.S. Facing Alarming Ammunition Shortfalls." *National Defense*. (April 2002): 4.

Farrell, Lawrence P., Jr.. "Policy Issues that Matter to Industry." *National Defense*, (March 2002): 4.

Ferris, Stephen P., Lieutenant, U.S. Naval Reserve. *A Shortage of Seed Corn: Managing the Defense Industrial Base*. Parameters, Summer 1994.

Flournoy, Michele A. "Report of the National Defense University: Quadrennial Defense Review." *Institute for National Strategic Studies, National Defense University, Washington D.C.* (November 2000).

Summary: This report presents twelve strategy decisions for the next administration and includes a chapter and appendix assessing risk in the QDR.

Froomkin, A. Michael, "Reinventing the Government Corporation." *Illinois Law Review.* (1995): U. Ill. L. Rev. 543.

Summary: This article supports the assumption that "placing public funds, public monopolies, or public power, in the hands of unelected, unappointed, almost certainly unimpeachable, and largely unaccountable private parties poses a serious and largely unexplored challenge to accountable, efficient, democratic national government."

Gulledge, Larry, Deputy Commander, Operations Support command (PROV) Operations Support Command (PROV) by Munitions and Armaments Command Installation Management Directorate SOSMA-IS. *White Paper: Ideas to Pay for Replenishment in Government-Owned Contractor-Operated Facilities (GOCOs).* August 2000.

Summary: Proposes that the cost for replenishment items should be identified and funded separately from peacetime product costs.

Gutmanis, Ivars and John F. Starns, "Whatever Happened to Defense Industrial Preparedness?" *Parameters* (summer 1997).

Summary: The defense industrial base has played a critical role in national security strategy because of its ability to design, develop, and manufacture technologically superior weaponry, which provides the Armed Forces with formidable capabilities. As budget cuts affect force structure, they will also impact on the defense industrial base. These impacts could be mitigated through acquisition reform.

Gutmanis, Ivars, "The Future of the Defense-Related Industrial Base in the United States." *Parameters* (Summer 1994).

Historical Perspective on the U.S. Defense Industrial Base, Appendix A.
http://www.nap.edu/readingroom/books/defman/app_a.html

Hix, M., J. Bondanella, B. Held, M. Hynes, D. Johnson, E. Pint, A. Pregler, M. Stollenwerk, J. Sollinger. *Freedom's Arsenal: A Strategy for Managing the Army's Arsenal and Ammunition Plants (DRAFT DRR-2776-A).* March 2002.

Hix, Mike, Dave Oaks, Bruce Held, Ed Keating, Michael Hynes, John Bondanella. RAND, Arroyo Center *Update on PBD407 Study.* 18 October 2001.

Hix, W. Michael, David Oaks, Bruce Held, Edward Keating, Michael Hynes, John R. Bondanella. RAND, Arroyo Center "Documented Briefing: Options for Managing the Army's Arsenals and Ammunition Plants." Not dated.

Hynes, Michael, Sheila Nataraj Kirby, Jennifer Sloan, *A Casebook of Alternative Governance Structures and Organizational Forms*, RAND, Forces and Resources Policy Center of RAND's National Defense Research Institute, 2000.

Summary: Summarizes twelve alternative governance structures and organizational forms with examples of that form of governance along with and pros and cons.

Industrial Operations Command. *Capability Summary FY2000*.

Jablonsky, David. "Army Transformation: A Tale of Two Doctrines." *Parameters* (autumn 2001).

Kennedy, Harold. "Army's Pine Bluff Arsenal Seeks New Assignments." *National Defense* (March 2002): 20.

Kennedy, Harold. "Funds for Demilitarization Drop More than 30 Percent." *National Defense* (May 2002): 28-29.

Summary: It is notable that conventional demil activities are conducted primarily at a dozen or so Army ammunition plants, depots and arsenals around the U.S..

Larson, Eric V., John E. Peters. *Preparing the U.S. Army for Homeland Security: Concepts, Issues, and Options*. ISBN: 0-8330-2919-3. 2001.
Appendix I provides a list of Mission-Critical Facilities and Systems.

Larsen, Fritz. "Arsenal Consolidation Study." SOSMA-PA PowerPoint Presentation, 28 June 2001.

Lynch, Roberta "Can Markets Govern?" *The American Prospect* (Vol. 5, no. 16, 1 December 1994).

Summary: Ms. Lynch discusses the merits and shortcomings of the proposals set forth in the book *Reinventing Government* by Osborne and Gaebler.

Markusen, Ann. "The Case Against Privatizing National Security." *Governance* (June 2001).

Summary: Ms. Markusen asserts that there may be savings and/or higher productivity to be gained from further Pentagon privatization, but advocates have not buttressed their case with hard evidence, especially given the complexity of the national security mission. Few studies try to unpack the logic of private versus public; most rely on an assertion of the superiority of the private sector.

McInerney, Thomas G. LTG, USAF (Ret.). Statement before the Quadrennial Defense Review Pursuant to the Military Force Structure Review Act Of 1996. 29 April 1997.

Motsek, Gary. *Ammunition Laydown*. Army Materiel Command PowerPoint Presentation to the Army Chief of Staff, 04 January 2002.

National Academy Press. Committee for the Workshop on Technical Strategies for Adoption of Commercial Standards in Defense Procurement, National Materials Advisory Board, Division on Engineering and Physical Sciences, National Research Council. "The Impact of Acquisition Reform on Department of Defense Specifications and Standards for Materials and Processes: Report of the Workshop on technical Strategies for Adoption of Commercial Materials and Processing Standards in Defense Procurement." 11-12 October 2000.

Summary: Report summarizes the results, both positive and negative, of the 1994 policy memorandum directing the Secretaries of the military departments DOD to take concerted action to increase access to commercial state-of-the-art technology and adopt business processes characteristic of world-class suppliers. This memorandum also had a major impact on specifications and standards.

National Defense Industrial Association, Munitions Summit. "Ammunition Readiness...Another View." PowerPoint presentation delivered by LTG Roy Beauchamp, Deputy Commanding General, U.S. Army Materiel Command. 13 February 2002.

Summary: Presentation includes a graphic that demonstrates the complexity of the industrial base.

National Defense Industrial Association, Munitions Summit. "Ammunition Readiness: The Operational Reality." PowerPoint presentation, presented by MG Wade H. McManus, Jr., Commander, U.S. Army Operations Support Command. 13 February 2002.

Summary: McManus, Commander, Army Operations Support Command, gave this presentation. It includes a graphic outlining the production base realities, one of which is that there are critical commodities without domestic sources.

National Defense Industrial Association, Munitions Summit. "PEO Ammo Update." PowerPoint presentation, presented by COL (P) Paul S. Izzo, Program Executive Officer, Ammunition, U.S. Army Materiel Command. 14 February 2002.

Naughton, Col James. Notes from 14 February 2002 meeting between LTC Tarantino and Col Naughton, ADCS-Ammunition.

Summary: Documents Col Naughton's opinions and concerns regarding the privatization of the organic base.

Naughton, Col James. White Paper "Ammunition Industrial Facilities Consolidation, Privatization and Disposal." 19 June 2001.

Summary: Following implementation of the recommendations provided in the Industrial Base Assessment, the Army has reduced the cost of ammunition by 50 percent, and significantly reduced the cost of maintaining the base. The paper also states that excessing decisions have significant cost implications and seldom result in actual property disposal – but they do disrupt attempts to 'commercialize' the facility.

No author listed, adapted from the 2001 Industrial College of the Armed Forces Shipbuilding Industry Study. "Shipbuilding Sector Remains Uncompetitive." *National Defense* (March 2002): 32-33.

Summary: Excess capacity continues to cause industry instability. Redundant capabilities in public and private shipyards warrant further consolidation or closure. Near exclusive reliance on Department of Defense contracts by private shipyards has stifled the required investment and innovation necessary to compete in the commercial markets.

OSC Regulation 10-9. Department of the Army, Headquarters, U.S. Army Operations Support Command. *Organizations and Functions: Mission and Major Functions of the U.S. Army Operations Support Command (OSC) Inactive and Excess Army Ammunition Plants (AAPs)*. 4 April 2000 and 4 January 2001.

OSC Review of RAND Phase III Draft Report. Submitted to the Center for Army Analysis on 9 April 2002.

Summary: Review comments state specific concerns/issues related to statements in the Report then provide a proposed solution with the associated rationale.

Peckenpaugh, Jason. "Pentagon Acts to Shore Up Contracting Base." *GovExec.com* (5 February 2001).

Peters, Katherine McIntire. "Down to the Core." *Government Executive Magazine* (1 May 1999).

Summary: The author sees two potential scenarios resulting from the Pentagon's overreach for savings from privatization: Either the savings won't be achieved, even though the money has already been budgeted for other programs, or the political pressure on the department becomes so great that it contracts out core functions in order to meet the savings targets. This could produce a serious risk to the department's mission, which is national security.

Pidgeon, Paul D., Captain, USAF. "Privatization in Place and the Base Closure Community: Newark Air Force Base, Ohio 1993-1995." Graduate School of Logistics and Acquisition Management of the Air Force Institute of Technology. September 1996.

Pint, Ellen M., John R. Bondanella, Jonathan Cave, Rachel Hart, Donna Keyser, *Public-Private Partnerships, Background Papers for the U.S.-U.K. Conference on Military Installation Assets, Operations, and Services*, RAND, Arroyo Center, 2001.

Summary: Report provides an overview of private-sector involvement in the provision of support services in the U.K. and the U.S. Army.

PriceWaterhouseCoopers. "A Brief on Privatization, FGCs and Public Private Partnerships." PowerPoint presentation, n. d.

Summary: Presentation provides an overview of the benefits to the government of privatization, formation of FGCs and Public/Private ventures. Page 12 has an overview of the FGC U.S. Enrichment Corporation, which is a private firm established in July 1998. It is a global energy company that started out as an organization in the Department of Energy and was privatized in 1998. However, it is a company whose market is not predominantly Government; therefore, its applicability as an example of the future for the organic base is limited.

PriceWaterhouseCoopers for Munitions and Armaments Center. *Cost-of-Ownership Study Update*. Final Draft Report, 9 February 2001.

Summary: Report provides an overview of the cost of ownership. The average cost of ownership per installation is less than \$1.2 million; the contingent liability for these facilities is \$939 million, which must be paid prior to divestiture of the facilities, and the Armament Retooling and Manufacturing Support program (ARM) is an effective method to reduce installation ownership costs.

PriceWaterhouseCoopers for Operations Support Command. *Business Case Analysis on the Disposal of Indiana and Sunflower Army Ammunition Plants*. Final Report, 9 May 2000.

PriceWaterhouseCoopers prepared for the Army Material Command. *Commercial Enterprising: The Key to Footprint Reduction at Army Ammunition Plants*. Final Report, n. d.

Summary: The Department's goal is to integrate the organizations and processes that address industrial capabilities into its existing budget, acquisition, and logistics process. The Industrial Base Review is designed to ensure that systematic analysis of industrial capabilities is a key part of DOD's everyday decision-making.

PriceWaterhouseCoopers. *1999 ARMS Program: Savings and Economic Impacts*. July 2000.

PriceWaterhouseCoopers. *ARMS Program (1993-1999): Savings and Economic Impacts*. August 2001.

PriceWaterhouseCoopers. *ARMS Program (1993-2000): Savings and Economic Impacts*. August 2001.

PriceWaterhouseCoopers. *Cost-of-Ownership Study Update for Munitions and Armaments Center*. Final Draft 9 February 2001.

PriceWaterhouseCoopers. *Dual Rates Cost/Benefit Analysis at Watervliet Army Arsenal*. 4 May 2001.

PriceWaterhouseCoopers. *Munitions and Armaments Center: Cost-of-Ownership and Workload Model Requirements Studies*. Final Report, 8 February 2000.

PriceWaterhouseCoopers. *Parcelization – Business Case Analysis: Disposing Army Ammunition Facilities*. October 2001.

Summary: Findings and conclusions from the report state that the Parcelization process is not incentivized to maximize value, only to maximize cost.

PriceWaterhouseCoopers. *Reducing the Footprint and a Business Case Analysis of: Disposing of Army Ammunition Facilities*. December 2001.

Summary: Presentation has a chart with the methodologies used to determine requirements at the arsenals and ammunition plants.

PriceWaterhouseCoopers. *Report on ARMS Team Benefit Computations and Facility Expenditures, Maintenance and Facility Improvement and Economic Analysis*. 1999.

PriceWaterhouseCoopers. *Whole Base Transformation Public/Private Partnerships: A Scenario for Fort Meade, Volume I: Executive Summary*. 20 February 2001.

PriceWaterhouseCoopers. *ARMS Program Strategic Analysis: Executive Summary and Results by AAP*. N. d.

PriceWaterhouseCoopers. *The Army's Industrial Base – the Radford Model: an Economic Regeneration Model using ARMS*. January 2002.

Programs and Conclusions: 2000 Munitions Functional Areas Assessment, 2000.

PUMA Policy Brief No. 2, Public Management Service. *Best Practice Guidelines for Contracting Out Government Services*. February 1997.

Summary: Report states that the evidence is fairly clear that contracting out can lead to efficiency gains, while maintaining or increasing service quality levels. It then proceeds to identify the key success factors for achieving the benefits of contracting out.

Quadrennial Defense Review Report, Chapter VI., *Revitalizing the DOD Establishment*. August 2001.

Shirk, Thomas M., "Ammunition Industrial Base – Point of Decision," White Paper

Summary: "The facilities, manufacturing processes and personnel of the ammunition industrial base are suffering from a reduction in work, funding and technology investment. In its current state, it is not ready for the production of precision munitions and will require serious attention to engage in the increased production of legacy munitions and its environmental remediation prior to divestiture."

Starr, Paul. "The Meaning of Privatization." *Yale Law and Policy Review* 6 (1988): 6-41.

Steinberg, Barry P., "Legal and Policy Impediments to Privatization Environmental Cleanup of Base Realignment and Closure Properties." White Paper, Kutak Rock LLP.

Tarantino, William J., LTC, Memorandum For Record. 27 February 2002.

Summary: This memorandum highlights a discussion between LTC William Tarantino (Center for Army Analysis) and Mr. Pat Thatcher (Vice President with Dan Zimmerman).

Tarantino, William J., Memorandum For Record. 22 February 2002.

Summary: This is a record of follow on information to a 21 February discussion with Mr. R.B. Auger, Deputy for Ammunition/Deputy Chief of Staff for Ammunition. Discussion pointed out that the most important assets the government has are the real estate and permits needed to produce ammunition and that there is no direction in the DPG for the U.S. Army to divest, only for the Army to reduce non-mission critical facility inventories to industry standards by FY 2007.

The White House, Office of the Press Secretary, Executive Order #12919 *National Defense Industrial Resources Preparedness* 6 June 1994.

Thomason, James S. "Assessing Resource Options for National Security Preparedness." *Parameters* (summer 1994).

Trunkey, R. Derek, Jonathan W. Leland, and Samuel D. Kleinman. *Working Capital Funds in DoD: Making Them Work*. CRM 98-135.50. September 1998.

U.S. Army HQ, Industrial Operations Command, Armament Systems Process Division. *Worldwide Market Survey for Trinitrotoluene (TNT) Sources, Final Report*. Rock Island, Il., January 2000.

Summary: Based on projected use, the existing U.S. TNT inventory will be depleted in FY03. The report recommends acquiring limited amounts from offshore sources for evaluation, continued assessment of possibly greater offshore production levels, and obtaining DOD commitment for acceptable foreign sources.

U.S. Government Printing Office, Washington, D.C.. Office of Technology and Assessment. *Redesigning Defense: Planning the Transition to the Future U.S. Defense Industrial Base*. 1991.

United States General Accounting Office, General Government Division. *Privatization: Questions State and Local Decisionmakers Used When Considering Privatization Options*, GAO/GGD-98-87. April 1998.

United States General Accounting Office, High-Risk Series. *Defense Infrastructure*, GAO/HR-97-7. February 1997.

Summary: DOD has identified net infrastructure savings as a funding source for modernization but has not, as yet, achieved anticipated savings. As a result, DOD has been unable to shift funds to modernization as planned. DOD has found that infrastructure reductions are a difficult and painful process because achieving significant cost savings requires up-front investments.

United States General Accounting Office, Report to Congressional Requestors. *Ammunition Industrial Base: Information on DOD's Assessment of Requirements*, GAO/NSIAD-96-133. May 1996.

Summary: The distinction between GOCO and COCO facilities is blurring as the government leases inactive facilities to commercial contractors. According to the DPG, the key measure of the health of the base is its ability to replenish the stockpile following two major regional conflicts. Although the industrial base is able to meet the replenishment requirements following a major regional conflict, replenishment is likely to be costly due to production facilities for new items being built for efficient production at peacetime requirement levels. Therefore, funds would be required to expand some of these facilities to meet replenishment requirements.

United States General Accounting Office, Report to Congressional Requestors. *Defense Logistics: Military Bases: Cost to Maintain Inactive Ammunition Plants and Closed Bases Could Be Reduced*. GAO/NSIAD-97-56. February 1997.

United States General Accounting Office, Report to Congressional Requestors. *Army Industrial Facilities: Workforce Requirements and Related Issues Affecting Depots and Arsenals*. GAO/NSIAD-99-31. November 1998.

Summary: Arsenals are funded through the AWCF and hourly labor rates are intended to recover operating costs, including material, labor and overhead expenses. Nonetheless,

these military facilities may find it difficult to follow business like practices. Army requirements may make it necessary to maintain capability to perform certain industrial operations even though it would not seem economical. If military customers need products that are inefficient to produce, the depots and arsenals must produce them.

United States General Accounting Office, Report to Congressional Requestors. *Outsourcing DOD Logistics: Savings Achievable But Defense Science Board's Projections Are Overstated.* GAO/NSIAD-98-48. December 1997.

Summary: The estimated annual savings suggested by the DSB were overstated due to errors in estimates, overly optimistic assumptions, and legal and cultural impediments. Contract administration and oversight savings and one-time inventory savings were also overly optimistic, as was the time frame assumed for completion of outsourcing activities.

United States General Accounting Office, Report to Congressional Requestors. *Defense Depot Maintenance: Privatization without Further Downsizing Increases Costly Excess Capacity.* GAO/NSIAD-96-201. September 1996.

Summary: Depot maintenance privatization should be approached carefully, allowing for evaluation of economic, readiness, and statutory requirements that surround individual workloads. Privatizing activities, if not effectively managed, including downsizing of remaining DOD infrastructure, could exacerbate existing capacity problems and the inefficiencies inherent in under use of capacity.

United States General Accounting Office, Report to Congressional Requestors. *Closing Maintenance Depots: Savings, Workload, and Redistribution Issues* GAO/NSIAD-96-29. March 1996.

Summary: GAO states that DOD's current budget estimates understate the actual cost of closing 10 depots, primarily because the estimates do not reflect closure-related costs that either have been or will be paid from the operation and maintenance account.

United States General Accounting Office, Report to Congressional Requestors. *Federal Electricity Activities: The Federal Government's Net Cost and Potential for Future Losses, Volume 1* GAO/AIMD-97-110. September 1997.

United States General Accounting Office, Report to Congressional Committees. *Force Structure: Opportunities for the Army to Reduce Risk in Executing the Military Strategy.* GAO/NSIAD-99-47. March 1999.

Summary: This report outlines the areas in which the Army has been negligent about defining and addressing risk in its quest to modernize and transform.

United States General Accounting Office, Report to Congressional Committees. *Defense Working Capital Fund: Improvements Needed for Managing the Backlog of Funded Work*, GAO-01-559. May 2001.

United States General Accounting Office, Report to the Chairman, Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate. *Defense Logistics: Unfinished Actions Limit Reliability of the Munitions Requirements Determination Process*, GAO-01-18. April 2001.

Summary: The DOD is improving the munition procurement requirement determination process. Improvements include coordinating the threat assessment; updating time estimates for enemy repair and replacement; damage assessments for input into the services' battle simulations models, modifying the target allocation process, and making a more comprehensive risk assessment.

United States General Accounting Office, Report to the Chairman, Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate. *Defense Management: Army Could Achieve Efficiencies by Consolidating Ammunition Management*, GAO/NSIAD-99-230. September 1999.

Summary: Though the Secretary of the Army is officially the single manager of the conventional ammunition program, its actual administration is distributed among three major Army commands: Industrial Operations Command, the Tank-Automotive and Armaments Command, and the Program Executive Office for Ground Combat Support. This has led to a fragmentation of management responsibilities and accountability and inefficiencies that adversely impact the ammunition industrial base.

United States General Accounting Office, Report to the Chairman, Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate. *DOD Competitive Sourcing: Results of Recent Competitions*, GAO/NSIAD-99-44. February 1999.

United States General Accounting Office, Report to the Chairman, Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate. *Defense Depot Maintenance: Uncertainties and Challenges DOD Faces in Restructuring Its Depot Maintenance Program*, GAO/T-NSIAD-97-112. 1 May 1997.

Summary: The accuracy of savings estimates tied to the outsourcing of depot maintenance is questionable. DOD is facing large shortfalls in its modernization accounts, and plans to reduce costs and generate savings for modernization through the outsourcing of support activities, such as depot maintenance. The projected savings assumptions were based on operations support activities such as stocking shelves, operating motor pools, and cutting grass – activities which require low skills and little capital investment. However, large capital investment and highly skilled personnel are required to do depot maintenance work.

United States General Accounting Office, Report to the Chairman, National Security Committee, House of Representatives. *Defense Depot Maintenance: Commission on Roles and Mission's Privatization Assumptions Are Questionable*, GAO/NSIAD-96-161. July 1996.

Summary: The report states that privatizing essentially all depot maintenance under current conditions would not likely achieve expected savings and could result in unacceptable readiness and sustainability risks. The extent to which DOD's long-term privatization plans and market forces will effectively create more favorable conditions for outsourcing is uncertain. Without highly competitive and capable private sector markets, the cost and readiness risks of privatizing depot maintenance workloads may prove unacceptable.

United States General Accounting Office, Report to the Honorable Vic Snyder, House of Representatives. *Military Base Closures: Progress in Completing Actions from Prior Realignments and Closures*, GAO-02-433. April 2002.

Summary: While early transfer authority can benefit all parties, it has not yet been exercised widely within the BRAC process. Several factors have worked against its application, such as community adversity to taking risks, the absence of ready-to-implement reuse plans, the lack of support from state and local regulators, changes in intended property reuse, and distrust of DOD.

United States General Accounting Office, Report to Congressional Committees. *Defense Inventory: Army War Reserve Spare Parts Requirements Are Uncertain*. GAO/01-425. May 2001.

United States General Accounting Office, Testimony before the Subcommittee on Readiness, Committee on Armed Services, U.S. Senate. *Defense Depot Maintenance: Uncertainties and Challenges DOD Faces in restructuring Its Depot Maintenance Program*, T-NSIAD-97-112. 1 May 1997.

Summary: DOD's inability to overcome problems in these high-risk areas has resulted in billions of dollars being wasted and placed billions of dollars in future spending at risk. This testimony discusses the (1) high-risk areas of financial management, information technology, weapon systems acquisition, contract management, infrastructure, and inventory management; (2) underlying causes of these high-risk areas; and (3) overall strategy that GAO believes is needed to eliminate them.

United States General Accounting Office, Testimony Before the Subcommittee on Defense, Committee on Appropriations, U.S. Senate. *Defense Depot Maintenance: Challenges Facing DOD in Managing Working Capital Funds*, GAO/T-NSIAD/AIMD-97-152. 7 May 1997.

Summary: Summarized the history of the WCF, highlighting its evolution and the management challenges associated with this form of funding.

United States General Accounting Office, Testimony Before the Subcommittee on Readiness, Committee on National Security, House of Representatives. *Defense Outsourcing: Challenges Facing DOD as It Attempts to Save Billions in Infrastructure Costs*, GAO/T-NSIAD-97-110. 12 March 1997.

Summary: GAO concurs that substantial savings can be achieved by outsourcing and privatizing. However, it should only be done when it makes economic and operational sense based on a series of steps outlined. Additionally, GAO stated that they have concerns about whether the 20- to 30-percent savings assumed by the Services could actually be achieved. The savings assumptions were based on unverified projections rather than on actual A-76 savings and where audited, the estimated savings did not achieve the projections.

United States General Accounting Office, Testimony Before the Subcommittee on Readiness, Committee on Armed Services, U.S. Senate. *Defense Depot Maintenance: Privatization and the Debate over the Public-Private Mix*, GAO/T-NSIAD-96-148. 17 April 1996.

Summary: DOD's current policy signals a clear intent to shift workloads to the private sector when readiness, sustainability and technology risks can be overcome. Such a shift, if not effectively managed, including the downsizing of remaining depot infrastructure, could exacerbate existing excess capacity problems and the inefficiencies inherent in underutilization of depot maintenance infrastructure. However, privatizing depot maintenance workloads in the current environment is not likely to achieve the savings DOD expects and may even be more costly.

United States General Accounting Office, Testimony Before the Subcommittee on Military Readiness, Committee on National Security, House of Representatives. *Defense Working Capital Funds: DOD Faces Continued Challenges in Eliminating Advance Billing*, GAO/T-NSIAD-97-221. 22 July 1997.

United States General Accounting Office, Testimony Before the Subcommittee on Technology and Procurement Policy, Committee on Government Reform, House of Representatives. *Public-Private Partnerships: Factors to Consider When Deliberating Governmental Use as a Real Property Management Tool*, GAO-02-46T. 1 October 2001.

US Army War College. *How the Army Runs: A Senior Leader Reference Handbook, Chapter 12: Logistics Management*. 2001-2002.

US Code Section 2522. *Armament retooling and manufacturing*.

US Code: Title 10, Section 2501
Outlines National security objectives concerning national technology and industrial base.

CAA-R-02-37

US Code Title 50, Appendix-War and National Defense, Defense Production Act of 1950, as amended.

Victorino, Louis D., James J. McCullough. "Use of the Department of Defense Priorities and Allocations System in Operation Enduring Freedom." GCA No. 01-9-30.

Wilhite, Anne Marie, Systems Engineering Process Office. "Systems Engineering at MITRE: Risk Management." *The MITRE Corporation* (September 1998).

Wilson, Alan G. "Footprint Reduction at RIW/WVA Under PBD 407." SOSMA-PA PowerPoint presentation. N. d.

APPENDIX D GAO REPORTS

The following is a synopsis of major observations from the US General Accounting Office reports concerning the four prior Base Realignment and Closure rounds. The observations were chosen based on tracking the evolution of the BRAC process and identifying problem areas.

Table D.1. GAO/NSIAD-90-42
(page 1 of 3 pages)

A Review of the 1988 BRAC Process	Comments
1989 – Army methodology – “generally sound.”	
Impact – Environmental and Community economic – “not significant.”	
Double-counting errors <ul style="list-style-type: none"> • square footage • acreage <i>(affected the relative military value)</i>	RPLANS/ARRM data integrity should be reviewed prior to the next BRAC
Estimates for MILCON costs and savings from land sales and personnel eliminations are subject to change.	MILCON costs per COBRA; land sales historical data show a lack of savings realization.
Cost analysis and report preparation took two months. Management control procedures for verifying the accuracy of collected data, and the results of its analysis, were not effective.	May require site visit for data verification
Future BRACs should be given sufficient time to estimate economic impact costs so they can be included in cost models.	Include economist on team
BRAC decisions should be based on military value.	
Cost and savings estimates for the bases reviewed included a number of errors and excluded certain relevant costs.	Require AAA from the beginning of TABS. Include economist on team.
Stressed three main analysis factors: <ul style="list-style-type: none"> • Increase military effectiveness • Environmental and economic impacts • Determine options that paid back < 10 years 	Payback is a short-term perspective, but should be considered. Also consider net present value (NPV).
Conclusion: Model was sound; application of model had errors.	
Analysis failed to consider utilities (water and sewer) expansion at the receiving installation.	
Analysis overstated savings to the federal government since it did not account for the cost to the government of increased Medicare roles when closing a medical treatment facility (MTF).	Medicare is an aside issue for the Services, as it is an OSD-level issue.
Ordnance cleanup is not a problem if the base is kept open.	A DOD decision will be tentative if UXO is included in analysis. Environmental costs are not included, but closing an installation can impact the timing of environmental cleanup.

**Table D.1. GAO/NSIAD-90-42
(page 2 of 3 pages)**

A Review of the 1988 BRAC Process	Comments												
<p>Costs to the US Park Service were ignored in past analyses. <i>Observations on the analyses supporting proposed closures and realignments follow.</i></p> <ul style="list-style-type: none"> • AAA audited Army data. • Army's process was well documented (<i>engendered support from GAO</i>). • COBRA Model was used (<i>found data errors and didn't account for Medicare</i>). <p>Although DOD called for 1991 dollar estimates, Service cost estimates did not always follow this guidance</p>	<p>Get AAA representative on team early. The COBRA model (or similar model) should help the Services be consistent with cost estimates.</p>												
<p>Army major closure decisions:</p> <ul style="list-style-type: none"> • Presidio of San Francisco, CA • Fort Sheridan, IL • Jefferson Proving Ground, IN • Lexington Army Depot, KY • Army Material Technical Lab, MA • Fort Douglas, UT • Cameron Station, VA 													
<p>Phase I - Army categorized its installations by major mission categories and quantified their military value.</p> <ul style="list-style-type: none"> • Fighting and maneuver • Major training areas • Training schools • Command and control • Industrial activities • Corps of Engineers (COE) • Army Reserves 	<p>This categorization is commonly referred to as "stove-piping"</p>												
<p>Phase II – Future Years Force Structure Plan, Phase I results, and MACOMs' vision of the future.</p> <p>a. Measures of Merit</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">i. Mission Essentiality</td> <td style="text-align: right;">250</td> </tr> <tr> <td>ii. Mission Suitability</td> <td style="text-align: right;">250</td> </tr> <tr> <td>iii. Operational Efficiency</td> <td style="text-align: right;">150</td> </tr> <tr> <td>iv. Expandability</td> <td style="text-align: right;">150</td> </tr> <tr> <td>v. Quality of Life</td> <td style="text-align: right;"><u>200</u></td> </tr> <tr> <td></td> <td style="text-align: right;">1000</td> </tr> </table> <p><i>(Under each measure of merit, the Army developed quantifiable attributes. The GAO thought it was a reasonable approach with AAA corrections.)</i></p>	i. Mission Essentiality	250	ii. Mission Suitability	250	iii. Operational Efficiency	150	iv. Expandability	150	v. Quality of Life	<u>200</u>		1000	
i. Mission Essentiality	250												
ii. Mission Suitability	250												
iii. Operational Efficiency	150												
iv. Expandability	150												
v. Quality of Life	<u>200</u>												
	1000												
<p>The Army identified Ft. Rucker airspace as a unique asset that could not be duplicated elsewhere.</p>													

Table D.1. GAO/NSIAD-90-42
(page 3 of 3 pages)

A Review of the 1988 BRAC Process	Comments
Command and Control Facilities by rank: Belvoir Meade Ritchie Shafter McPherson Monroe Gillem Myer Devens (<i>only closure</i>) Totten Hamilton	
OSD guidance directed the Services to consider the impact that a recommended BRAC action would have on the surrounding region's economy.	Get AAA on team early. The COBRA model (or similar model) should help the Services be consistent with cost estimates.
Air Force considered impacts on local communities before recommending closures; Army and Navy considered impacts after recommending closures and only for those facilities that were recommended to close.	
<i>OSD noted inconsistencies in the way that the Services estimated the costs and savings associated with recommended closures (different years and cost factors used in their baseline analyses), and objected to the lack of standardization.</i>	Get AAA on team early. The COBRA model (or similar model) should help the Services be consistent with cost estimates.
GAO Recommendation: Ensure the use of consistent procedures and practices among the Services in determining future BRAC recommendations.	Consistency between Services will require early coordination as well as OSD guidance.

**Table D.2. GAO/NSIAD-91-224
(page 1 of 2 pages)**

A Review of the 1991 BRAC Process														
Military Value was again a key component of this analysis.														
GAO was concerned that DOD's guidance allowed estimating processes and cost factors used by the Services to vary. GAO analyzed the sensitivity of years to recover closing costs for each closure or realignment to 50 percent and 100 percent increases in one-time costs. The analysis showed that the payback period for many of the recommendations did not substantially increase. However, several recommended closure and realignment actions were sensitive to one-time costs.		The 1991 analysis shows that one time costs can determine realignments/closures.												
Army again used a two-phased approach to evaluate potential bases for closure or realignment that was designed to treat all bases equally.														
Army major closure decisions: Fort Benjamin Harrison, IN Fort Devens, MA Fort Ord, CA Sacramento Army Depot, CA		MILCON costs per COBRA; land sales should not be considered due to historical lack of savings realization.												
Phase I - Army categorized installations by major mission categories and quantified their military value (no change from 1988 BRAC). <ul style="list-style-type: none"> • Fighting and maneuver • Major training areas • Training schools • Command and control • Industrial activities • Corps of Engineers • Army Reserves 		May require site visit for data verification.												
Measures of Merit <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">i. Mission Essentiality</td> <td style="text-align: right;">250</td> </tr> <tr> <td>ii. Mission Suitability</td> <td style="text-align: right;">250</td> </tr> <tr> <td>iii. Operational Efficiency</td> <td style="text-align: right;">150</td> </tr> <tr> <td>iv. Expandability</td> <td style="text-align: right;">150</td> </tr> <tr> <td>v. Quality of Life</td> <td style="text-align: right;"><u>200</u></td> </tr> <tr> <td></td> <td style="text-align: right;">1000</td> </tr> </table> <p><i>(Under each measure of merit, Army developed quantifiable attributes. GAO agreed that this was a reasonable approach with AAA corrections.)</i></p>	i. Mission Essentiality	250	ii. Mission Suitability	250	iii. Operational Efficiency	150	iv. Expandability	150	v. Quality of Life	<u>200</u>		1000		
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ii. Mission Suitability	250													
iii. Operational Efficiency	150													
iv. Expandability	150													
v. Quality of Life	<u>200</u>													
	1000													
Early on, the Army decided not to close any National Guard or Reserve installations.		Closure may be decided; however, realignment would offer possible efficiencies.												

Table D.2. GAO/NSIAD-91-224
(page 2 of 2 pages)

A Review of the 1991 BRAC Process	
Under each measure, the Army developed quantifiable attributes that could be used to compare similar installations. For operational efficiency, expandability, and quality of life, the Army developed common attributes to be used by all installations; MACOMs could add to this list. For example, AMC added attributes covering (1) work force availability, (2) total unused maintenance capacity, and (3) total unused supply capacity to the standard attributes under the expandability measure. The attributes under the mission essentiality and suitability measures were developed by the MACOMs and tailored to the specific installation categories. Attributes were also weighted to illustrate their relative importance within a mission.	This approach reinforces the stovepipe approach. Appropriate weighting of attributes is important for installation characterization.
The Army's process was well documented, which enabled the GAO to evaluate the process and the AAA to provide a check in the process. Thus, the GAO agreed that the resulting recommendations were well supported.	
The COBRA Model was used (data errors emerged and it did not account for Medicare). Overall, the GAO accepted that the recommended base closures and realignments offered an opportunity for substantial savings.	
In January 1990, the SECDEF recommended closure of 35 additional installations, and realignment or reduction of forces at more than 20 others. Service processes varied and none were as well documented and supported as the BRAC 88 recommendations.	
Concerned by the SECDEF's recommendation, the Congress passed an act requiring, in part, that all installations be equally considered for possible closure or realignment (regardless if it had previously been considered for closure), and halted any closure actions for bases on the closure list that employed more than 300 civilian employees.	Past decisions would restrict possibilities if allowed to remain.

Table D.3. GAO/NSIAD-93-173
(page 1 of 2 pages)

A Review of the 1993 BRAC Process	Comments
The SECDEF, on 12 March 1993, recommended 165 closures, realignments, and other actions affecting bases within the US	
In 1991, the DOD recommended closure of 43 bases and realignment of 28 others. The BRAC Commission amended this to 34 closures and 48 realignments, which was accepted by the President and Congress.	
The GAO stated that OSD savings appeared to be overstated but substantial, and stated that OSD did not exert adequate oversight of the Services.	
The Army proposed closure and realignment actions that affected seven bases. The GAO found that the recommendations and selection process were well documented; the AAA audited the data. The decision not to recommend closing Ft. Monroe was considered unsupported. In particular, the use of environmental cleanup costs, as a justification for actions should not be a prime consideration because environmental restoration costs were not to be included as a basis for closure. The Defense Language Institute (DLI) was removed from the closure list by the SECDEF based on Intelligence Community concerns.	
A 1991 amendment to the Defense Base Closure and Realignment Act requires that persons who submit information to the SECDEF or the Commission "shall certify that such information is accurate and complete to the best of that person's knowledge and belief." The SECDEF is responsible for enforcement.	Need all MACOMs, IMAs, and ACSIMs to certify information.
<p>The Assistant Secretary of Defense (ASD) (Production and Logistics) issued memoranda on 4 August and 4 December 1992 that—</p> <ul style="list-style-type: none"> • Required installations with like missions, capabilities, or attributes to be grouped together for evaluation; • Stated that when a particular group of installations is found to have no excess capacity, the DOD component does not need to perform further analysis of that portion of the base structure; • Required DOD components to develop measures and factors for applying the DOD selection criteria and to describe the relationship between each measure and factor used with the criteria. 	Stove piping limits flexibility. Efficiencies can be managed by including all installations.
Army major closure decisions: Vint Hill Farms, VA	
The OSD's oversight role could/should be strengthened	Joint push.
Cross-Service opportunities were not considered when evaluating maintenance depots for possible closure.	Joint push.
Economic Impact – direct and indirect – was first calculated.	
Acceptable Impact \leq 3 percent of population	
Unacceptable Impact \geq 5 percent of population	

Table D.3. GAO/NSIAD-93-173
(page 2 of 2 pages)

A Review of the 1993 BRAC Process	Comments
Sacramento was "subjectively" determined to be substantially more than 5 percent even though it was only 5.6 percent of population.	
Overall, the GAO found the Army analysis to be "generally sound."	
Military value and ranking were assessed in Phase I.	
Forts Meade, Myer, Ritchie, and Shafter were deferred from study—nothing was noted in the Army Vision that affected them.	Nothing should be deferred from study; all installations should be looked at in the same manner.
The Army did not calculate the costs or savings of realignment and closure actions for the military health insurance program.	Should be determined if such cost can be calculated and evaluated

Table D.4. GAO/NSIAD-95-133
(page 1 of 2 pages)

A Review of the 1995 BRAC Process	Comments
<p>The Army had 15 categories of facilities –</p> <ul style="list-style-type: none"> • Maneuver • Training areas • Command and Control (C&C)/Administrative Support • Training schools • Ammo storage facilities • 10 lesser categories 	
<p>The Army Stationing Study required the following force structure:</p> <ul style="list-style-type: none"> • 10 Division equivalents • 2 Armored Cavalry Regiments • 32 Maneuver brigades 	Force structure decisions need to be determined prior to stationing.
<p>1995 capacity = 29 brigades + Milcon = 38 brigades planned capacity.</p>	
<p>33 closures of major installations—26 major realignments—27 changes to prior BRAC decisions.</p>	
<p>OSD Standard Factors questioned in the COBRA model were the:</p> <ul style="list-style-type: none"> • Willingness of civilian employees to relocate. • Percent of above who would obtain other government jobs as a result of the Priority Placement Program. 	Need to confirm all standard factors.
<p>The Office of Management and Budget (OMB) agreed to allow OSD to use a discount rate tied to the U.S. Treasury's borrowing rate.</p>	
<p>The following figures are indicative of relative value of the BRAC property in terms of net present value at a 4.2 percent discount rate in 1996 dollars:</p> <ul style="list-style-type: none"> • Army \$6,945.2M • Navy \$7,457.0M • AF \$3,656.1M 	
<p>Environmental cleanup costs (major bases) including unfinished prior BRAC rounds was estimated to be \$6B, \$4B for the first three rounds; \$2B for the 1995 BRAC, \$147M for minor bases.</p>	
<p>Cross-Service potential by group:</p> <ul style="list-style-type: none"> • Depot maintenance excess capacity (EC) = 40.1M direct labor hours (24,830 work years) • Test and Evaluation (EC) = 495K test hours • Labs (EC) = 9,800 work years • Med. Treatment Facs. (EC) = 1 Med Center. 2 Med Centers and 13 Hospitals should be realigned. • Undergraduate Pilot Training (EC) = 33 percent of airfield operations (fixed wing); 108 percent of available ramp space (rotary wing). 	Potential efficiencies may exist.

Table D.4. GAO/NSIAD-95-133
(page 2 of 2 pages)

A Review of the 1995 BRAC Process	Comments
Services consolidated within own facilities, but not cross-Service.	
<p>Army major closure decisions-</p> <ul style="list-style-type: none"> • Fort McClellan, AL • Fort Chaffee, AK • Oakland Army Base, CA • Fitzsimmons Army Medical Center, CO • Savanna Army Depot Activity, IL • Fort Holabird, MD • Fort Ritchie, MD • Bayonne Military Ocean Terminal, NJ • Seneca Army Depot, NY • Fort Indiantown Gap, PA • Fort Pickett, VA 	
<p>The Congressional Budget Office (CBO) reported that the DOD could reduce costs by delaying expensive remediation projects when contamination poses no imminent threat and cost effective technology is lacking. The CBO also stated that new cleanup technologies were the best hope of addressing environmental problems.</p>	<p>Environmental "cleanups" should be defined in a policy statement for all Services to follow.</p>
<p>Services still disagreed on how the COBRA Model should be used.</p>	<p>Need to resolve.</p>
<p>A growing data burden was noted. While some saw this as an increasing burden and questioned to what extent all of the data were actually used in decision making, others saw benefits in having the extensive data available to fully assess individual bases. Some also saw a benefit in having consistent data requests and analyses from one round to the next. No clear consensus for any change seemed to emerge except for one -- that prior BRAC rounds had eliminated all but the best bases, and distinguishing between individual bases could become increasingly difficult in future rounds. The implications were that a few characteristics could be key to distinguishing between some bases in the future and should be kept in mind by the components in developing their data calls.</p>	
<p>In BRAC 1995, some bases had to respond to data requests from a cross-Service group as well as to data requests from their Service headquarters. This was an extra burden that could be avoided if cross-Service reviews were completed before the Services' BRAC processes began.</p>	<p>Data reports should be coordinated to limit redundancy.</p>

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APPENDIX E GAO COMPARISONS OF SERVICES' METHODOLOGIES AND DEFICIENCIES IN PAST BRAC ANALYSES

This appendix provides a compendium of comments from the Government Accounting Office reports that evaluated past Service processes used in the 1988, 1991, 1993, and 1995 BRAC rounds. The comparisons represent the GAO's assessments of the three Services across BRAC processes categories; deficiencies represent what the GAO identified as needing improvement. Black, *italic* font indicates assessments and commentary provided by the Center for Army Analysis.

Notably, according to GAO, the Services seem to improve their processes with each BRAC round. Yet, the GAO's assessments and criticisms of the Services appear to increase with each successive report (GAO/NSIAD Report Numbers—90-42, 91-224, 93-173, and 95-133). This may be due to the leveling of GAO's learning curve and increasing observations to draw on when critiquing each succeeding BRAC round. The Army seems to receive less criticism from GAO than the other Services.

In 1988, the BRAC Commission was held accountable for many aspects of the GAO review. This type of accountability ended in 1991 when the Services were primarily held accountable for deficiencies in their respective approaches. This evolution can be traced to the following--

On 29 January 1990, the SECDEF recommended additional closures and realignments as a result of the shrinking defense budget. The Congress subsequently passed the Defense Base Closure and Realignment Act of 1990, which halted any closure actions based on the January 1990 list and required all installations in the U.S. to be compared equally against (1) criteria to be developed by DOD and (2) the Future Years' Force Structure Plan. Although the DOD was now nominally responsible, subsequent GAO evaluations of later BRAC rounds seemed to encourage more DOD oversight, but the Services received the bulk of the GAO criticisms, which suggests that the Services provided the majority of BRAC analyses. Given the reality that the Services are better able to conduct their own analyses, the Army established the Total Army Basing Study group in 1990 to develop a stationing strategy and recommend closures and realignments.

Figure E.1 GAO Comparisons of Services' Methodologies and Deficiencies in Past BRAC Analyses

BRAC Round	Army	Navy	Air Force (AF)
1988	Deficiencies		Regarding technical training bases -- the AF was found to have inadequately accounted for facilities deficiencies because they used measures that were too broad; i.e., the relative "size" of the deficiency was largely ignored in their red, amber, green rating scheme.
	Comparison		
1991	Deficiencies	The Navy did not document the rationale for its decisions; therefore, the GAO developed their own analysis for comparing ship-berthing data with force structure plans and thereby corroborated Navy's recommendation for fewer Navy bases. Further, the Navy did not establish required internal controls to ensure the accuracy of the data used.	
	Comparisons	The Army used a new construction markup cost for design, site preparation, supervision, inspection, overhead, and contingencies equal to 44 percent. The Army examined local/regional economic impacts of recommended closures and realignments per the OSD guidance. The Army assumed it would pay 11.2 percent of annual salary severance pay to each employee that was unemployed as part of a Reduction in Force (RIF).	The AF directed its major commands to select candidate bases, and the commands made their selections based on various internal assessments. Air Force markup = 45-50 percent.
		Ditto Navy.	The AF did an extensive analysis using a regional economic model. However, AF officials indicated that economic impact (and environmental) was not a major factor in their decisions.

BRAC Round		Army	Navy	Air Force (AF)
1993	Comparisons	<p>The Army proposed closure and realignment actions that affected seven bases. The GAO found that the recommendations and selection processes were well documented, and that the AAA had audited the data.</p>	<p>The Navy proposed closure and realignment actions that affected 28 bases. The GAO found that the recommendations and selection processes were generally sound, and the Naval Audit Service (NAS) had audited the data. The GAO's review showed the selections were driven by an overarching goal of reducing excess capacity among categories of bases while considering military value. The Navy process relied heavily on the acceptance of certain assumptions and military judgments.</p> <p>Generally, the Navy developed a return on investment analysis only for configurations for bases that were selected for closure and realignment. Greater savings may have resulted from alternative scenarios. The overriding goal of the Navy's process was the elimination of as much excess base capacity as possible throughout the Navy.</p>	<p>The AF proposed closure and realignment actions that affected seven bases. The GAO's review showed that the recommendations generally appeared to be sound.</p>
	Deficiencies	<p>The decision not to recommend closing Ft. Monroe was not adequately justified.</p>		<p>Judgments that were made in the final stages of the selection process for certain categories of bases were not well documented</p>

BRAC Round	Comparisons	Army	Navy	Air Force (AF)
1993	<p>The Army's philosophy was that each Major Command must articulate its vision (how it will organize and operate) for the future before optimal basing decisions can be made. Alternatives proposed by MACOMs (or whomever) were examined for consistency with the force structure, the Army basing strategy, the major commands' reshaping proposal (visions), and the DOD selection criteria.</p> <p>Tools:</p> <ul style="list-style-type: none"> - COBRA model used to calculate affordability of alternatives - DOD's Office of Economic Adjustment Model used to calculate socioeconomic impact - Office of the Chief of Engineers environmental impact assessments - Installation military value assessments <p>The Army assumed it would pay 11.2 percent of annual salary severance pay to each employee who was affected by the Reduction in Force.</p> <p>The Army deviated from the DOD standard of 10 percent when calculating the administrative costs to support closure and realignment actions. The Army used 1 percent, and although there is no analytical basis for the 10 percent standard, the Army's use of the lower factor may have understated these costs.</p>	<p>The AF performed:</p> <ol style="list-style-type: none"> 1) Base capacity analysis (including on-site surveys at 48 bases). 2) Compared capacity data to the future years' Force Structure Plan. <p>Bases were analyzed against all eight DOD selection criteria with priority given to military value and with emphasis on readiness and training, future mission, and cost Color-coding (red, amber, green) was used to distinguish military value.</p>	<p>Navy - 15 percent</p> <p>All three Services assumed that receiving installations would incur no additional cost to hire new employees to meet the new/added requirement. The DLA used a standard factor of \$1,056 for each new employee hired.</p>	<p>AF - 31 percent (based on the assumption that the RIF would impact more employees, thus averaging more years of</p> <p>The Air Force's process remained largely subjective and was not well documented. It was also influenced by preliminary estimates of base closure costs that changed when more focused analyses were made.</p>

BRAC Round		Army	Navy	Air Force (AF)
1993		<p>Cross-Service opportunities were missed in the case of depot maintenance activities and laboratory facilities. The Army did not fully adhere to its regular process for installations in assessing military value when recommending minor and leased facilities for closure. Closures were based on the judgments made by its Major Commands, i.e., installations were excess and of low military value.</p>	<p>The Secretary of the Navy did not consistently apply the DOD's criteria when he excluded certain facilities from closure for economic impact reasons.</p>	<p>For example, some bases were removed from initial consideration based on these estimates. Also, in some instances, closure costs appeared to materially affect how bases were valued. For example, Rome Laboratory, Rome, NY, was ranked high for retention purposes largely based on projected high closure costs. The AF later reversed this decision after a subsequent review of the suggestion by a cross-Service group.</p>
1995	<p>Deficiencies</p>	<p>The Army's proposed realignment of Letterkenny Army Depot -- parts of their tactical missile maintenance workload were given to Tobyhanna and Anniston depots, which reversed a 1993 decision to consolidate this entire maintenance function at Letterkenny. Thus, in the minds of some, the concept of consolidated maintenance was jeopardized.</p>		
	<p>Comparisons</p>	<p>The Army had 15 facility categories. The major categories were combat maneuver installations, major training areas, command and control/administrative support, training schools, and ammunition storage facilities.</p>	<p>The Navy placed all of its activities into one of five categories: operational support, industrial support, technical centers/laboratories, educational/training, and personnel support/other.</p>	<p>The Air Force had seven base operational categories that encompassed small and large aircraft and missile bases; technical training and education facilities; undergraduate flying training; other/administrative; space operations; industrial/depot test facilities and laboratories; and Guard and Reserve facilities.</p>
		<p>In addition to quantifiable data, the Army relied upon other measures to assess excess capacity--i.e., "The Army Stationing Strategy" study, and senior leader input estimating that the Army could now house 29 brigades in the US without any new construction; 38 brigades with new construction.</p>	<p>To assess excess capacity, the Navy used personnel throughput as a capacity indicator for its training air stations. Operational air station capacity was measured by the number of air squadrons that could be housed in terms of hangar and required support space.</p>	

BRAC Round	Army	Navy	Air Force (AF)
1995	<p><i>DOD's BRAC policy guidance stipulates that personnel reductions associated with force structure reductions may be included in BRAC savings. Other military personnel reductions occurring at bases slated for closure or realignment may be counted as savings, to the extent that they represent reductions in salary costs. While such reductions are taken, they may not always result in reductions in authorized end strength. The Army indicates that it does not expect to take commensurate reductions in end strength, but will reassign personnel elsewhere rather than remove them from the force structure.</i></p> <p>The Army did not recommend closing or realigning any test and evaluation (T and E) facilities proposed by the cross-Service group.</p> <p>The Army proposed closing one laboratory internally realigning its functions, The Army chose not to move its propellant work to China Lake, CA.</p>	<p>The Navy indicates that it reduces its end strengths to match military personnel reductions resulting from BRAC.</p> <p>The Navy recommended some reductions and consolidations of T and E activities based on its own analysis, largely unrelated to the work of the cross-Service group.</p> <p>The Navy eliminated a significant number of laboratory installations.</p>	<p>AF—ditto Navy.</p> <p>AF—ditto Navy.</p> <p>The AF elected to realign laboratory functions within its own infrastructure.</p>

APPENDIX F INDUSTRIAL BASE INSTALLATION OVERVIEW

F.1 Introduction. The industrial base, as a combination of both public and private facilities, has served the nation during a multitude of conflicts and wars. Historically, changes to the Industrial Base have occurred mostly due to the demands placed upon it, rather than any substantial changes to its organization or structure. Following the end of the Cold War, the Industrial Base started to undergo significant changes. As the Army moves forward with its stationing analysis, the Industrial Base is one area that may provide potential efficiencies (savings to the Army) with consolidation, privatization or other action. Appendix F addresses the current state of the Industrial Base, which will provide a basic understanding of its complex nature.

F.2 Management of the Organic Industrial Base

In March 1975, the Department of Defense (DoD) established the Single Manager for Conventional Ammunition (SMCA) within the Office of the Secretary of the Army. As such, the Army is the Executive Agent for the tri-service stockpile of conventional ammunition. Responsibilities include planning, programming, budgeting, procurement, production, storage, inventory, accountability, surveillance, inspection, maintenance, stockpile reliability, malfunction investigations, out loading, and demilitarization functions.¹ In addition to being the central procuring and logistics agency for conventional ammunition common to all military Services, the Army's responsibilities also include managing the Army's ammunition production facilities.

The Secretary of the Army is officially recognized as the Single Manager for conventional ammunition; it is the Army's Industrial Operations Command, a subordinate command of the Army Materiel Command, which is responsible for the day-to-day execution of the Single Manager role. In practice though, ammunition management responsibility is split among three major Army commands. In addition to the Industrial Operations Command, the Tank-Automotive and Armaments Command (TAMCO), also a subordinate command of the Army Materiel Command, and the Program Executive Office for Ground Combat Support Systems, which reports to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (Acquisition Executive), have significant ammunition management responsibilities, as well as other responsibilities. Figure F-1 shows the interrelationship between commands that have Program, Project, or Product Managers responsible for procuring conventional ammunition for their programs. Figure F-2 shows how that structure is being revised to improve oversight effectiveness.

¹ OSC Regulation 10-2, *Mission and Major Functions of the U.S. Army Munitions and Armaments Command (MAC)* dated 4 January 2001, paragraph 4.g., page 3.

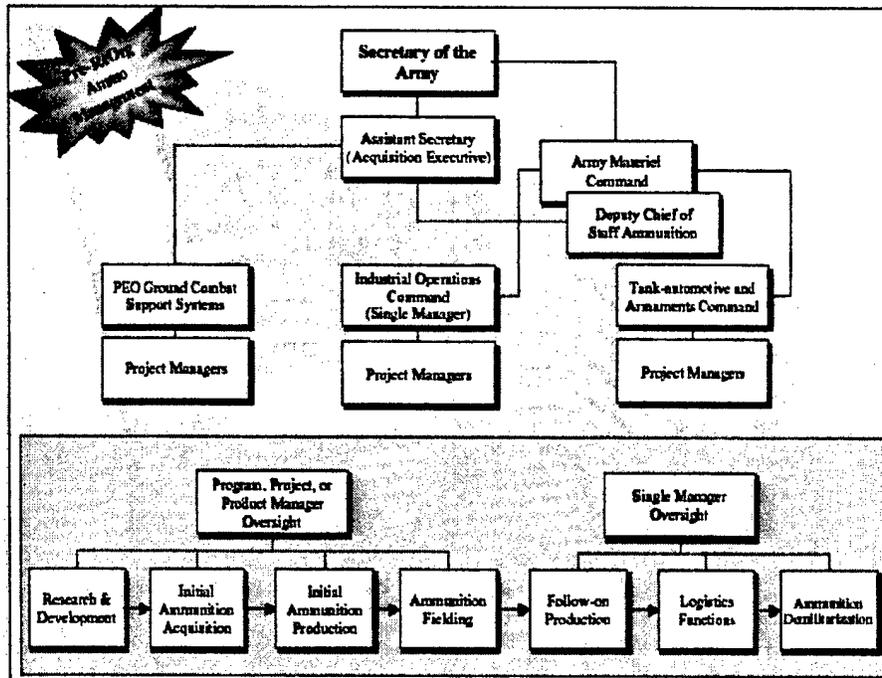


Figure F-1. Pre-reorganization Ammunition Management

As part of the in-progress reorganization, the structure for oversight of the Ammunition Program is being modified as shown in Figure F-2.

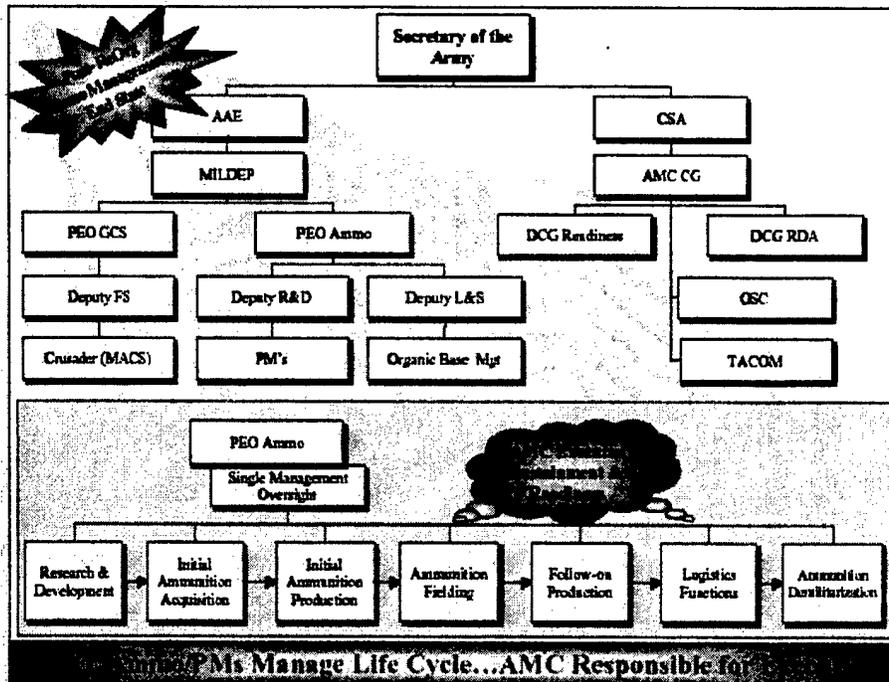


Figure F-2. Post-reorganization Ammunition Management²

² PEO Ammo Update presented by COL(P) Paul S. Izzo, Program Executive Officer, at the National Defense Industry Association's Munitions Summit, St. Louis, Missouri, February 2002.

F.3 The Requirements Process

In 1994, the Department of Defense standardized the process by which the Services determine their munition requirements, to generate consistent munition requirements Department-wide, and to ensure that the Services have both an adequate supply and the appropriate types of munitions to address changing mission needs. In 1997, the Department of Defense issued Instruction 3000.4, which set forth policies, roles and responsibilities, timeframes, and procedures to guide the Services as they develop their munition requirements. This instruction is referred to as the Capabilities-Based Munitions Requirements process and is the responsibility of the Under Secretary of Defense for Acquisition, Technology and Logistics.

The instruction describes a multiphased analytical process that begins when the Under Secretary of Defense for Policy develops, in consultation with the Chairman of the Joint Chiefs of Staff, the Services, and the combatant commanders, policy on munition requirements for the Defense Planning Guidance (DPG). The Defense Intelligence Agency (DIA) uses the Defense Planning Guidance and its accompanying warfighting scenarios as well as other intelligence information to develop a threat assessment. The DIA threat assessment contains estimates and facts about the potential threats that the United States and allied forces could expect to meet in different scenarios. The combatant commanders, in coordination with the Joint Chiefs of Staff, use the threat assessment to allocate each Service a share of the identified targets by phases of the war.

Next, the Services develop combat requirements using scenarios examined in battle simulation models to determine the number and mix of munitions needed to meet the Combatant Commander's objectives separately by each war scenario. To develop these requirements, the Services draw upon and integrate data and assumptions from the DPG requirements, warfighting scenarios, and target allocations, as well as estimates of repair and return rates for enemy targets and projected assessments of damage to enemy targets and installations. Other munition requirements include munitions (1) needed for forces not committed to support combat operations, (2) to provide a post-major theater of war combat capability, and (3) to train the force, support service programs, and peacetime requirements. These requirements, in addition to the combat requirement, comprise the Services' total munitions requirement. The total munitions requirement is then balanced, along with projected inventory and affordability, to determine how many of each munition the Services will procure within their specified funding limits and used to develop the Services' Program Objective Memorandum and Presidential budget submission.³

F.4 Army Industrial Base Program (AIBP)

Army Regulation (AR) 700-90 establishes Headquarters, Department of the Army, basic policies, responsibilities, and procedures governing the operation of the AIBP. This program includes the development and maintenance of an Industrial Base capable of supporting approved military operations during peacetime, surge, and mobilization. The following figure, from

³ U.S. General Accounting Office, *Defense Logistics-Unfinished Actions Limit Reliability of the Munitions Requirements Determination Process* GAO-01-18 (Washington D.C.: April 5, 2001). Page 4.

LTG Roy Beauchamp's (AMC, Deputy Commanding General) presentation below, given at the National Defense Industry Association's Munitions Summit in February 2002, illustrates the complexity of the interrelationship between the private sector and the organic industrial base.

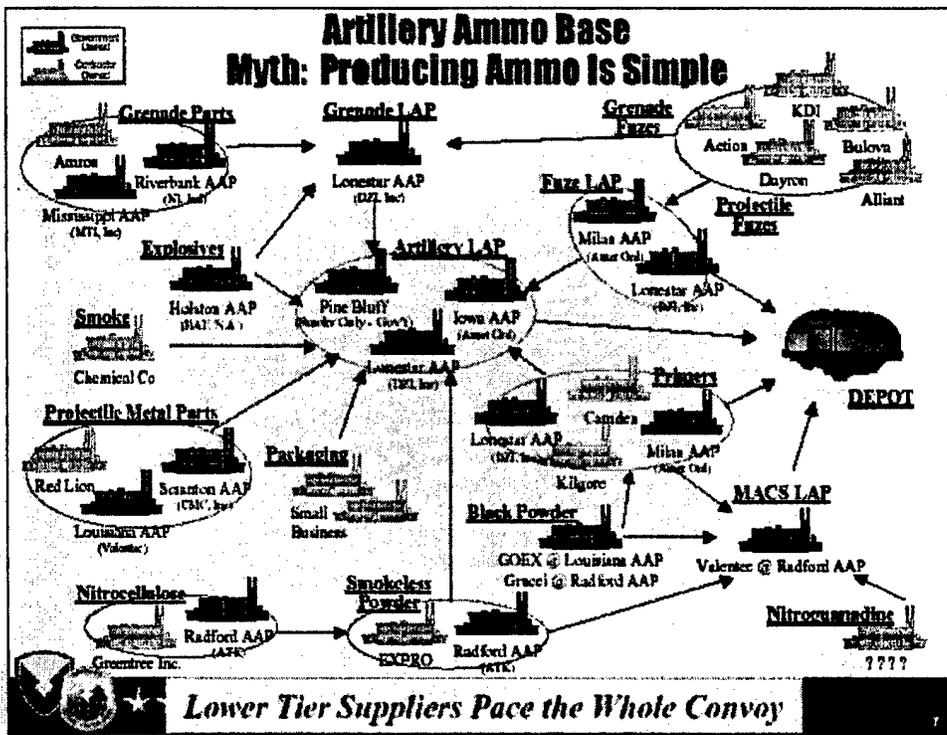


Figure F-3. Interrelationship of the Industrial Base

The Industrial Base goals, as set forth in AR 700-90, are to strive to obtain and maintain an Industrial Base capable of indefinite wartime sustainability and a range of production responses to a wide variety of possible contingencies. In support of these goals, Chapter 5, AR 700-90, spells out the Production Base Support Program (PBSP) policy; applicable portions are included here.

Chapter 5 implements PBSP policies in Department of Defense Directive 4275.5, and supplements guidance in AR 37-100-FY. Included are policies and procedures for programming, budgeting, and funding of government and private facilities that make up the Army's industrial base. Guidance is provided for initial acquisition, construction and equipping of production, production testing, depot-level maintenance, and depot level supply facilities. Expansion, rehabilitation, replacement, retention, and modernization of existing facilities are also covered. PBSP policy states:

The Army places primary reliance on private industry to provide facilities for production of military items. The only exception to that policy is for the production of lethal munitions, because Army policy is to avoid substantial investment of private capital in production facilities solely used for the manufacture of items having no civilian use (see paragraphs 4-2 and 4-4).

Facility projects will be programmed for an installation or plant according to its assigned mission and the approved master plan.

F.5 Adjustments in the Industrial Base

The end of the Cold War, and subsequent changes to defense missions, resulted in declining budgets and conventional ammunition requirements. Ammunition procurement funding for all Services declined significantly, falling from a peak level of about \$4.3 billion in fiscal year 1985 to about \$2 billion in fiscal year 1999, with about one-half of the total allocated for procurement of Army ammunition. Requirements for conventional ammunition also changed as the Services decreased their dependence on traditional ammunition items and increased reliance on highly technical, precision munitions. Decreasing requirements for conventional ammunition resulted in a reduction in the number of both government-owned and private sector production plants. The number of government-owned ammunition plants decreased from 32 in 1978 to 22 in 1999.⁴

The decline in defense spending has impacted the private sector as well as the organic base. Fewer contracts issued by the government have resulted in greater competition between competitors. This more competitive environment, in turn, prompted a major contraction in the defense industrial base. With the market shrinking, U.S. defense companies sought alternative means of maintaining the volume of business necessary to survive. A furious pace of mergers and acquisitions resulted during the first half of the decade, whittling the ranks of both prime contractors and secondary suppliers. While in 1990 there were nearly a dozen major U.S. producers of military and aerospace equipment, there are now fewer than half those numbers, some of which are the parent company for prime munitions producers. Five of the largest U.S. defense companies - Boeing, Litton, Lockheed Martin, Northrop Grumman, and Raytheon - - were formed over the past 10 years with the combination of close to 50 once-independent companies.⁵ The number of contractor-owned conventional ammunition plants declined from 286 in 1978 to just 72 in 1999.

⁴ U.S. General Accounting Office, Report to the Chairman, Subcommittee on readiness and Management Support, Committee on Armed Services, U.S. Senate. Defense Management *Army Could Achieve Efficiencies by Consolidating Ammunition Management*, GAO Report NSIAD-99-230 (Washington D.C.: September 30, 1999). Pgs 5-9.

⁵ AIAA Defense Reform 2001 *A Blueprint for Action*. Presented at the Defense Reform 2001 conference in Washington D.C.: February 2001. Page 3. AIAA is the American Institute of Aeronautics and Astronautics, which is a defense industry lobby organization.

F.6 The Organic Industrial Base

Table F-1 lists the US Army Organic Continental United States (CONUS) Industrial Base Infrastructure, as listed in the *Army Industrial Base Strategy*, Appendix A, dated 30 Aug 01. For consistency, *inactive* is defined as those plants that are no longer assigned production but are retained to meet replenishment requirements. The Army is using the Armament, Retooling, and Support, which allow tenants to lease space at these plants, to reduce operation and maintenance cost. General information for this program can be obtained on the Operations Support Commands website at <https://www4.osc.army.mil/Arms/>.

Excess is defined as those plants that are no longer required for assigned mission and are in the process of being abolished. There are numerous installations that the Army is in the process of disposing of or transferring; for example, the transfer of Sunflower Army Ammunition Plant to the State of Kansas; the General Services Administration is disposing of Badger Army Ammunition Plant, Cornhusker Army Ammunition Plant, Joliet Army Ammunition Plant, and Longhorn Army Ammunition Plant; the Army Corps of Engineers is disposing of the Indiana Army Ammunition Plant under an agreement with the General Services Administration.⁶

⁶ Comments on excess were paraphrased from U.S. General Accounting Office. Report to the Chairman, Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate. Defense Management *Army Could Achieve Efficiencies by Consolidating Ammunition Management*, GAO Report NSIAD-99-230. (Washington, D.C.: September 1999). Pgs 5-9, 24.

Table F-1. U.S. Army Organic CONUS Industrial Base Infrastructure (as of 30 Aug 01)⁷

<p><u>Laboratory And Research, Development, and Engineering Centers</u> U.S. Army research Laboratory, Adelphi, MD U.S. Army Aviation and Missile Command, Redstone Arsenal, AL U.S. Army Communications-Electronics Command, Fort Monmouth, NJ U.S. Army Soldier and biological Chemical Command, APG, MD Natick Research, Development & Engineering Center, Natick, MA Edgewood Chemical and Biological Center, Edgewood, MD U.S. Army Tank-Automotive and Armaments Command, Warren, MI Armaments Research, Development & Engineering Center, Picatinny, NJ Tank-automotive Research, Development & Engineering Center, Warren, MI U.S. Army Simulation, Training and Instrumentation Command, Orlando, FL Cold Regions Research and Engineering Laboratory, NH Construction Engineering Research Laboratory, IL Fort Detrick (Medical Research Facilities), MD</p>
<p><u>Depots: Army Mission-Critical Facilities: Army Power Projection Platforms – Depots and Ammunition Plants⁸</u></p> <p><u>Maintenance</u> Anniston Army Depot, AL Letterkenny Army Depot, PA Red River Army Depot, TX Tobyhanna Army Depot, PA Corpus Christi Army Depot, TX Pine Bluff Arsenal, AR</p> <p><u>Munitions Storage Centers</u> (*: Facility to be closed at the end of Chemical Demilitarization mission) Blue Grass Army Depot, KY Hawthorne Army Depot, NV Pueblo Chemical Depot, CO (*) Sierra Army Depot, CA Tooele Army Depot, UT Umatilla Chemical Depot, OR (*) Letterkenny, Army Depot, PA Pine Bluff Arsenal, AR (Smoke/Pyrotechnics)</p> <p><u>Chemical/Biological Ammunition Storage</u> (*: Facility to be closed at the end of Chemical Demilitarization mission-.) Anniston Chemical Activity, AL Pine Bluff Chemical Activity, AR (Chemical/Biological storage) Umatilla Chemical Depot, OR (*) Deseret Chemical Depot, UT (*) Blue Grass Chemical Activity, KY Pueblo Chemical Depot, CO (*) Edgewood Chemical Activity, MD Newport Chemical Depot, IN (*)</p>
<p><u>Ammunition Production</u></p> <p><u>Active (government workload or competitively won production) Government-owned, Government-operated (GOGO)</u> Crane Army Ammunition Plant, IN McAlester Army Ammunition Plant, OK Pine Bluff Arsenal, AR (Chemical munitions assembly)</p> <p><u>Government-owned, Contractor-operated (GOCO)</u> Iowa Army Ammunition Plant, IA</p>

⁷ DCSLOG draft Army Industrial Base Strategy, Appendix A: U.S. Army Organic CONUS Industrial Base Infrastructure (as of 30 Aug 01).

⁸ U.S. Army DCS (Logistics) as listed in Appendix I "Army Mission-Critical Facilities and Systems" from *Preparing the US Army for Homeland Security*. RAND Publication © 2001. ISBN: 0-8330-2919-3.

<p>Lake City Army Ammunition Plant, MO Lone Star Army Ammunition Plant, TX Milan Army Ammunition Plant, TN Radford Army Ammunition Plant, VA Holston Army Ammunition Plant, TN Kansas Army Ammunition Plant, KS Louisianan Army Ammunition Plant, LA Mississippi Army Ammunition Plant, MS Riverbank Army Ammunition Plant, CA Scranton Army Ammunition Plant, PA</p> <p><u>Excess Government-owned</u></p> <p>Alabama Army Ammunition Plant, AL Badger Army Ammunition Plant, WI Cornhusker Army Ammunition Plant, NE Indiana Army Ammunition Plant, IN Joliet Army Ammunition Plant, IL Longhorn Army Ammunition Plant, TX Newport Army Ammunition Plant, IN (Chemical facility) Phosphate Development Works, AL Ravenna Army Ammunition Plant, OH Sunflower Army Ammunition Plant, KS Twin Cities Army Ammunition Plant, MN Volunteer Army Ammunition Plant, TN</p>
<p><u>Testing</u></p> <p>Aberdeen Proving Grounds, MD Dugway Proving Grounds, UT White Sands Missile Range, NM Yuma Proving Ground, AZ Cold Regions Test Activity, AK</p>
<p><u>Arsenals/Industrial Facilities</u></p> <p>Watervliet Arsenal, NY Rock Island Arsenal, IL Pine Bluff Arsenal, AR Lima Army Plant, OH</p>
<p><u>Port Installations</u></p> <p>Military Ocean Terminal Oakland, CA Military Ammunition Terminal Sunny Point, CA</p>
<p><u>Medical Center Installations (Consider Adding All Military Hospitals & Clinics)</u></p> <p>Fort Detrick, MD Walter Reed Army Medical Center, Washington, DC DeWitt Army Hospital, VA</p>

F.7 The Private Sector Industrial Base

The sharp reduction in the number of defense firms in the private sector has not been matched by a proportional elimination of excess manufacturing capacity. Debt loads, increased by consolidation, weakened some companies financially. In some cases, excessive payments for acquisitions aggravated the debt problem. Amid shrinking revenues and declining backlogs, industry's profitability and attractiveness to investors has declined rapidly. As industry's long-term debt burden increased to over \$25 billion in 2000, from under \$10 billion in 1995, some companies' debt ratings approached those of junk bonds.

Due to their weakened attractiveness to investors, some defense companies' cost of borrowing capital has raised to a level exceeding their prospective rate of return - an untenable situation. Further roiling industry's balance sheets were lagging profit margins, attributable in no small part to the preponderance of cost-plus contracts (The key defense companies' average margins in 1999 were 4.3 percent, a negligible amount compared to the 20, 30, even 40 percent often achieved by commercial high technology companies). In fact, at the end of the 1990s, there were only a handful of industries - such as shoe manufacturing and groceries - that fell below the defense industry's average rate of return. The results were an inability to invest in new ventures and smaller investments in the development of new technologies. Increasingly, the defense industry fell behind other industrial sectors andthe industry no longer enjoys the stable outlook, profitability, and level of investor confidence it once consistently did."⁹

F.8 Lessons Learned. The Army should consider the following lessons learned when examining the management of industrial facilities during the next BRAC round (not considered an exhaustive list).

a. In the United Kingdom (U.K.), a wide range of military support services is performed by unified, cross-service agencies making substantial use of private suppliers and competitive mechanisms. The RAND Corporation completed research for the Assistant Secretary of the Army for Installations and Environment to document existing U.S. and U.K. outsourcing and privatization efforts, and how the military might make more effective use of the private sector in providing support functions. This effort was documented in a report entitled Public-Private Partnerships¹⁰ *Background Papers for the U.S.-U.K. Conference on Military Installation Assets, Operations, and Services*, published in April 2000.

- In the *Base Operations Lessons Learned* section, several important issues relating to the U.S. Army's experience with military Base Operations Services are summarized. Three of the six listed in the report are applicable to the Army's organic Industrial Base and are listed below.
 - **Follow-up programs are needed to ensure that contracting achieves anticipated cost savings or quality improvement.** Although contract costs are compared with actual or hypothetical public sector costs to perform the same services at the time a contracting decision is made, there is frequently little follow-up to determine whether expected savings or quality improvements from contracting are achieved. For example, if the scopes of work or desired contract outputs are poorly defined, contract modifications that result in higher costs may be required. It may also be difficult to quantify the benefits of improved service or the costs of deteriorated service.
 - **Incumbent contractors must be subject to competition or other incentives to improve performance.** After an in-house activity is contracted out, the option to

⁹ AIAA Defense Reform 2001 *A Blueprint for Action*. Presented at the Defense Reform 2001 conference in Washington D.C. in February 2001. Page 5. AIAA is the American Institute of Aeronautics and Astronautics which is a defense industry lobby organization.

¹⁰ RAND, *Public-Private Partnerships: Background Papers for the U.S.-U.K. Conference on Military Installation Assets, Operations, and Services*. April 2000. Available at <http://www.rand.org/publications/MR/MR1309/>

bring it back in house is typically no longer available when the contract is recompleted. In addition, the incumbent contractor may be much better informed about the work to be done than any potential competitors. Therefore, it is important either to maintain competition to provide the service or to create incentives for the incumbent contractor to improve performance over time.

- **Appropriate flexibility of funds should be preserved.** When a support activity is put on contract, the customer is committed to set aside a portion of its budget to pay contract costs. This may be an advantage, if an activity commits funds to pay support or maintenance costs that are sometimes neglected or under funded, leading to reduced performance or higher costs in the future. But it may also limit the customer's flexibility to divert funding to higher-priority areas, such as unexpected deployments.

b. In addition to the Lessons Learned from base operations, three from Logistics are also applicable to the Army industrial base.

- **Incumbent contractors often have an advantage in competitions for complex services.** Under contracts for complex services incumbent contractors can gain significant information advantages over other potential bidders. When competition is not forthcoming, it can be important to be able to establish a productive long-term working relationship with these contractors, and to design contract incentives to reduce costs and/or improve performance over time. Other options include designing competitions to level the playing field between incumbents and other bidders, and purchasing intellectual property rights or technical data rights so that spares replenishment or repair work can be competed among third parties.
- **Contracts must be flexible to adapt to changing logistics needs.** The end of the Cold War also changed the U.S. Army's long-term needs for logistics support. Outsourcing and privatization contracts (as well as in-house logistics providers) must be flexible enough to allow for changes in logistics needs, and to ensure that providers will be able to support increased activity during deployment.
- **Innovative contracts are difficult to implement if too many independent decision makers must approve.** The U.S. Army appears to be stymied in its efforts to implement innovative outsourcing contracts by the need to reach consensus within the Army, with other DOD agencies, and with Congress. When changes are made to satisfy these independent decision makers, the scope for cost savings and performance improvement from outsourcing is reduced.

c. The Public Management Service (PUMA), an independent think tank that seeks to support its 30 member countries and interested non-member partners by addressing important, fast-moving changes in governance. PUMA published an article in February 1997 entitled Best Practice Guidelines for Contracting out Government Services¹¹ in which the Organization for Economic Cooperation and Development (OECD), the parent organization for PUMA,

¹¹ Organization for Economic Cooperation and Development The Public Management Service, *Best Practice Guidelines for Contracting Out Government Services*. Available at <http://www.oecd.org/pdf/M00004000/M00004107.pdf>

summarizes government contracting lessons. Those applicable to the organic Industrial Base are summarized below.

- **Focus on Staff Issues.** It should be recognized that contracting out is not only a financial and performance issue; it is also a people issue.
- **Monitor Performance and Foster Cooperative Relationships.** Contracting out an activity does not diminish, in any way, the responsibility of the organization for the performance of that service. This is especially relevant when that service is being provided to a third party. The organization should regularly and formally monitor the performance of the contractor to ensure that the performance standards stated in the contract are fulfilled
- **Ensure Valid Comparisons.** It is important when considering proposals for contracting out that all alternatives, which may include continued in-house provision, be comprehensively evaluated. This involves considering both the costs and outcomes or outputs, including comparative quality. All risks should also be systematically assessed. This includes the risk of dismantling in-house capabilities and possible dependence on a single supplier. A thorough costing of the present activity should be conducted and used as a benchmark for evaluating contracting out proposals. This involves identifying all costs related to the activity that is to be contracted out. These include not only the direct costs of the activity, but also its share in overhead costs and such non-cash costs as depreciation and cost of capital. The treatment of the present activity for taxation purposes also needs to be taken into account. If the present activity can be restructured in such a way as to offer improved performance, then this should be similarly costed and used as the benchmark for evaluating contracting out proposals.
- **Evaluating In-house Bids.** In-house staffs are often in the best position to identify opportunities for work process improvements. Their bid should be judged on the basis of these improvements
- **Foster Competitive Markets.** Competitive supplier markets are key to achieving the benefits of contracting out. The government should foster competitive markets by recognizing that its contracting-out practices can play a major role in the development of markets for the relevant services.
- **Develop and Maintain Necessary Skills.** Effective contract management requires a new set of skills for many government organizations. Recruitment and staff training policies need to take account of this. Organizations that contract out activities need to maintain their knowledge of the market and technical knowledge of the activity. This is imperative in order to be able to communicate with the contractor on equal terms, and to be in a position to effectively compete the activity again. This is especially relevant in the case of contracting out complex activities.

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APPENDIX G PUBLIC-PRIVATE PARTNERSHIPS – PAST ANALYSES

The following is a collection of insights on Public-Private Partnerships that should be considered if a PPP structure is suggested in the next BRAC or in any Army stationing exercise.

G.1 RAND Report 1998, titled “Use of Public-Private Partnerships to Meet Future Army Needs-Overall Utility of PPPs from the Army’s Perspective.”

Factors:

- a. The PPP is a promising, innovative approach to achieve research goals and infrastructure challenges.
- b. The Army lags in embracing PPPs. (Note: another report, below, indicates that the Army has a clear lead in number of PPPs over the other services.)
- c. Complementary partnership-

<u>Army</u>	<u>Private Firms</u>
Property	Marketing expertise
Buildings	Access to capital
Equipment	Leading-edge technology
Systems	Operating expertise
Scientific expertise	
Patents	
Databases	

- d. Candidates for PPPs are wherever the Army has-
 1. Underutilized properties
 2. Excess capacity of assets
 3. Intellectual property
- e. PPPs need Cooperative Spirit and Mutual Trust
- f. Pros-
 - The value of Army facilities is increased through leases during peacetime when the production lines are lukewarm at best. In wartime, the private firm is contractually obligated to meet the Army’s needs.
 - Building of commercial-type facilities by private firms through a leaseback arrangement whereby the Army keeps the facility and land in exchange for a share of the profits to the private firm.

- Split R&D costs on public-private joint ventures.
 - Permits the Army's early influence on technology.
 - Generates revenues that the Army can use for other research.
- Potentially provides a cost effective alternative to BRAC.
- The Army's motivation is to provide a service within a prescribed budget; corporation's motive is to provide services at a profit.

g. Cons-

- **Legality.** Conversion to a PPP depends on the functions under consideration not being inherently governmental or otherwise exempt from private sector performance. If this were the case, legislative relief would have to be sought and granted.
- **Public/political acceptance.**
- **Attractiveness to potential private partners.**
 - **Infrastructure (land leases) PPPs**--unknown market demand for the collaborative entity's product and therefore the unpredictability of profits. In other words, the Army's success in a PPP arrangement is totally contingent on the private firm's skill at generating a profit; the Army is strictly the landlord.
 - **Intellectual Property PPPs**- is even more uncertain than infrastructure PPPs.
- **Legal restrictions** forbid the Federal government from giving any single contractor a competitive edge over other contractors in the same line of business.

G.2 RAND Report, 14-16 April 2000, titled "US-UK Conference on Public Private Partnerships, Base Operations Working Group." Ultimately, RAND concluded that the US Army must apply creative strategies for the infrastructure on its bases, which are badly in need of improvement, before they deteriorate further. The Base Operations Working Group used the UK experience with private sector performance of base operations as a springboard to discuss strategies and opportunities for private sector involvement in US Army base operations.

Factors:

- The scope of infrastructure decay.
- Which functions and services are appropriate for private sector involvement?
- What incentives exist to prompt base commanders to contract services out?
- Creating appropriate and flexible partnerships with the private sector.
- Implementing cost accounting measures.
- Managing political challenges.

G.2 Observations related to the factors above

- a. Working group members implied that if the current situation is not a crisis, it soon will be.
- b. Members agreed that war fighting is a core military competency and that the preservation of the unique military culture, or ethos, couldn't be accomplished by an outside contractor. However, agreement dissolved as soon as the group considered functions outside this essential core.

c. US base commanders remain reluctant to enter into contracts with the private sector because commanders are frequently forced to divert funds to prepare for new missions, and believe that fixed contracts diminish their flexibility to do so. However, contracts that require no military investment, and in which the contractor owns the assets and assumes the risk, and the military receives 10 percent of the profits provide an incentive for base commanders to participate with the private sector.

d. One contentious area that needs to be addressed in discussions of privatizing military functions is how to compare the cost of in-house and outsourced services.

G.3 Air Force Institute of Technology Report, 1999, titled "Public-Public Partnerships: Development of an Alternative Outsourcing Method Decision Model--thesis"

The following findings and observations were derived through a case study of the Brooks Air Force Base (AFB) initiative to join in a public-public outsourcing partnership with San Antonio, TX in what is called a city-base concept. In the Brooks AFB initiative, base operations functions are outsourced, unlike the RAND examples above. One of the key points found throughout the Institute of Technology report is the preference for public-public partnerships over public-private partnerships.

Citations from outside sources highlight the risks inherent to partnerships, particularly public-private partnerships.

- a. **Citation 1:** The very nature of command and control changes as partnerships replace clear hierarchies. Long-term relationships between public and private entities govern the nature of these partnerships. They are relationships based on mutual trust and are disciplined by a common concern about reputation and by the availability of alternative sources and customers if expectations are not realized.¹
- b. **Citation 2:** Despite the enthusiasm for entrepreneurial government and privatization, the most egregious tales of waste, fraud, and abuse in government programs have often involved greedy, corrupt, and often criminal activity by the government's private partners and weak government management to detect and correct these problems.²
- c. **Citation 3:** Transaction Cost Economics (TCE) has gained popularity in recent years since it can be effectively used to guide decision makers through the outsourcing decision process. It has been noted, "political scientists are just beginning to apply transaction cost arguments to the issue of contracting out service in the public sector." Although TCE provides a sound theoretical foundation for the exploration of market versus hierarchical mechanisms for solving strategic dependencies, it suffers from not adequately exploring other available governance structures, repeated transactions, the

¹ Air Force Institute of Technology Report, 1999, titled "Public-Public Partnerships: Development of an Alternative Outsourcing Method Decision Model--thesis", 11.

² Ibid, 15.

dynamic evolution of governance and transactions, and the key roles of trust and equity in any interorganizational relationship.³

- d. **Citation 4:** As a consequence (of engaging in relations involving long-term investments which cannot be completely specified in advance), the parties to these rational contracts are exposed to a much broader range of trading hazards than their counterparts employing either market or hierarchical transactions experience.⁴

There are times when a long-term partnership may not be advantageous to the federal government. Strategic alliances may not be warranted for a number of reasons. One is the cost of alliances related to (1) coordination between organizations, (2) opportunity costs, and (3) loss of strategic flexibility. Another concern is the risk of collaboration associated with opportunism and knowledge leaks. Yet another concern is that perceptions of fairness may limit the government's ability to effect exclusive long-term relationships.

A RAND study, conducted at the request of the Commission on Roles and Missions of the Armed Forces, created by Congress in 1993, found several faults with the Commission's outsourcing model at that time. The RAND study noted:

- The simplified presumption in favor of a private source limits any effort to weigh the costs and benefits of public and private sources for any particular support service. As long as an activity is not inherently governmental, we presumably want to have it produced in the most cost effective manner possible.
- The approach gives limited attention to the difficulties that must be overcome to maintain an effective contractual relationship with a private sector source.

The third aspect of the Commission's approach that concerned RAND is the limited attention it gives to factors that should be considered to ensure successful implementation of any proposed outsourcing. The Commission implicitly promotes a rapid program of outsourcing services that could lead to early failures. That is, if DOD pursues extensive, expanded outsourcing without giving such factors adequate attention, it could fail to realize its expectations about improved performance and reduced costs.

- e. **Citation 5:** Contracting out needs to be considered whenever the government entity cannot take advantage of the economies of scale or scope. An important caveat is that contracting out does not necessarily imply outsourcing to the private sector. A large public sector entity can achieve scale and scope economies just as easily as a privately owned firm, e.g., local communities providing base operations support to military bases.⁵

³ Ibid, 20.

⁴ Ibid, 26.

⁵ Ibid, 39.

G.5 Office of the Deputy Under Secretary of Defense 1999, report titled—"Public-Private Partnerships for Depot-Level Maintenance: A review of public-private partnerships for depot-level maintenance and leases of DOD depot-level facilities".

G.5.1 Most partnerships have been established under statutory authority, although many are work share arrangements using memorandums of understanding (MOUs) or similar agreements. The Services identified five sections of 10 United States Code (USC) as the authority for 52 (64 percent) of the 82 partnerships, and three sections (2553, 4553, and 2208) were the predominant references. The following is a list of the principal authorities cited by the Services for the 82 public-private partnerships.

Title 10, section 2208j--Permits depots to sell articles or services outside DOD if purchaser is fulfilling a DOD contract and a public-private competition is used to award the contract.

Title 10, section 2469a--Requires competitive procedures in contracting for depot-level maintenance and repair workload formerly performed at defense military activity (DMAs) identified for closure or realignment act. Authorizes competition among private and public sector offers and public-private teaming.

Title 10, section 2553--Permits the Secretary of Defense to designate DOD industrial facilities, other than Army facilities governed by section 4543, to sell articles or services outside DOD under conditions similar to those in section 4543. Proceeds are to be credited to the funds incurring the costs of the manufacture or performance.

Title 10, section 2667--Allows the leasing of nonexcess equipment and facilities of a DOD activity to a person outside DOD. The leasing military department may use the proceeds.

Title 10, section 4553--Authorizes Army industrial facilities to sell articles or services outside DOD for specified purposes and under certain conditions, including that the goods or services are not commercially available in the United States and the sale will not interfere with the facility's military mission. The proceeds are to be credited to the funds incurring the costs of the manufacture or performance.

Federal Acquisition Regulation, Subpart 45.3--Establishes the conditions and limitations for providing equipment and facilities to a contractor or subcontractor.

G.5.2 Of all DOD partnerships, 48 percent involve the Army.

Pros-

- Increased capacity utilization.
- Improved depot-level maintenance rates.
- Improved Army readiness.

Positive effects are more evident in utilization and maintenance rates. It should also be noted that the effects of partnering were computed through a *subjective* scoring system computed by totaling scores based on the following *undefined* effects—none, nominal, moderate, and substantive.

G.5.3 Army Implemented PPP Projects, Ongoing or Complete – Summary

Anniston Army Depot

Vehicle/weapon conversion, upgrade, and maintenance - 22

Base operations - 3

Management studies - 1

Red River Army Depot

Vehicle/Weapon maintenance - 1

Tobyhanna Army Depot

Communications equipment repair - 3

Comm. equipment fabrication/manufacturing - 4

G.6 Center for Naval Analyses, Alexandria, VA 1994, report titled—“Partnerships in Military Health Care, part 1., a utilization review of ENT and GYN surgical services at Naval Medical Center, Portsmouth, VA”. Portsmouth’s objectives in creating these partnerships were to:

- Increase beneficiary access to direct care ENT and GYN surgical services.
- Increase surgical workload.
- Shift patients to same-day surgery.
- Partially recapture CHAMPUS costs for ENT and GYN services.

Utilization measures in the analysis included the following:

- Aggregate workload levels
- Physician productivity
- Case mix levels

Pros-

US Military staffing levels generally do not change from one year to the next, thus workload changes could more confidently be attributed to the partnerships. This type of partnership works in functional areas when the demand for services consistently outpaces the availability of providers. This partnership was a huge benefit to those work centers that wanted to keep workloads in-house and not contract out and is also a benefit to the military assignment officers who do not have to respond to staffing levels affected by workloads.

Overall, ENT and GYN partnerships have successfully increased beneficiary access to care, increased total inpatient workload, shifted a significant proportion of workload to the same-day setting, and achieved a considerable increase in regular inpatient case mix. (The study assumed that the command also achieved cost savings through the partial recapture of CHAMPUS dollars.)

ENT and GYN are not classical combat specialties and therefore are even better candidates for partnering than those specialties that are required for mobilization to theaters of operation.

G.7 Associated General Contractors of America and US Army Corps of Engineers Report on Partnering Best Practices - 2001.

Army and Air Force Projects

- 184 Family Housing Units, Altus AFB, Altus, OK.
- Base Realignment and Closure Project, Fort Leonard Wood, MO. (placed 45K yards of concrete and laid 625 miles of cable).
- Dover AFB, Dover, DE (new design and construction for the Air Mobility Command).
- Tertiary Wastewater Treatment Facility, Ft. Dix, NJ (demolition of old facility and construction of a new one).
- 99th RSC Headquarters and OMS/AMSA Facilities, Pittsburgh, PA (137,000 sq ft of major training center space).
- Whole Barracks Renewal, Ft. Riley, KS (\$50 million project to demolish old barracks and the construction of new barracks and other buildings/facilities).

G.8 Historically, FGCs were created to rescue a private/group of private enterprises performing/not performing missions essential to our national well-being and security. Army depots and arsenal functions were not always performed in the federal sector, but as our nation evolved these functions were moved under the federal umbrella to improve the nation's readiness for war. The US now at a point in its history when it seems that government favors turning these functions back to the private sector, with a degree of government regulation.

The five documents bearing on the subject were researched and are summarized below.

a. Newark Air Force Base (NAFB), Ohio (an Air Force guidance systems repair facility)-1996 doctoral thesis.

Background. As part of the 1995 BRAC, the AF wanted to close this installation, but the local communities in and around NAFB convinced the AF to permit them to buy the facility and to contract out the facility and workload.

Features

(Pro) Ensures continued "surge" capacity.

(Con) Indecision and typically slow transition to privatization could kill the installation before the transition is made--workloads and workers go elsewhere--other depots and contractors.

(Con) High cost of ownership-fair market value and maintenance; therefore, local governments and contractors may not accept the risk.

(Con) Contractor must make money: (1) Contractors may prefer their own facilities, (2) Addition of contractor commercial workloads to augment privatization in place (PIP) workloads.

(Con) Services' contract structure could actually preclude long-term success of PIP.

(Pro) Cost of continued GOGO facility precludes funding higher AF priorities. AF compromises to minimize risks to local government ownership and contractor profitability. AF allows contractor to bring in non-PIP workloads provided:

- Non-interference with PIP workloads.
- No impact to seismic limits of on going work, and use of government furnished equipment.

b. Fannie Mae & Freddie Mac - Case for changing from FGC to total Privatization - The Heritage Foundation - July 1996

Pros-

- Original mission (Depression Era genesis) of creating a vibrant secondary mortgage market has been met.
- Conflict of interest between regulator and advocate.
- Short-term economic benefits through increased competition.
- Branching out to new lines of business.
- Eliminates federal interference in the financial markets.

Cons-

- Conflict of interest between stockholders profits and public mission.
- Changing from a successful enterprise to an unknown state.
- Transfer of wealth from the taxpayers to a small number of shareholders.
- Possible conflicts with the "Takings Clause of the 5th Amendment."

c. "The Case Against Privatizing National Security," Council on Foreign Relations - Jan 2001

Neutral/Negative Comments

- Arguments favoring privatization envisions both competition-based savings and better quality weapons systems and services.
- The appearance of periodic industrial depressions and the pressure to privatize since the late 19th century.
- Estimated 2.2 million defense contractors in 2000. The ratios of contract/grant jobs to DOD civilians are 5:1 and 1.5:1 in the rest of government.
- Will private firms maintain the capability to produce under crisis situations if the government is not paying to keep lines "hot?"
- Competition produces the savings and not outsourcing per se. Sustaining competition in an era of large prime contractor implosions (e.g., increasing potential for collusion) may be difficult.

Negative Comments

- Securing the benefits of privatization requires the discipline of sustained competition and competent oversight by the Pentagon ... real prospects that these capabilities will

atrophy in the case of sole source and long-term contracts. Competent oversight erodes proportionate to the increase in contracting.

- Few studies try to unravel the logic of private versus public; most rely on an assertion of the superiority of the private sector; the issues of contracting problems (e.g., bankruptcy and supply disruption); the short- and long-term evaporation of competition, the potential for corruption, the loss of government competence, and the prospect of undue contractor influence in the conduct of military affairs are left to speculation.

d. Public Purpose and Private Service, Administrative Law Review, Summer 2000

- The “Bell Report - 1962” (named after the Bureau of the Budget’s Director David Bell) addressed the “highly complex partnership among various kinds of public and private agencies, related in large part by contractual arrangements.
- The Bell Report panel perceived that the “cumulative” effects of contracting could be debilitating. Over an extended period of time, the knowledge the government needs to control contractors might only be found within the contractors themselves.
- Moreover, through caps on the number of federal employees, the executive and legislative branches of government (and both major political parties) gave tacit endorsement to the continued growth of third party government.
- Title 18, Section 208 of the US Code provides for criminal sanctions for federal employees who work on matters in which they have substantial financial interests. These provisions do not govern the third party work force nor are the contractors currently bound to disclose most corporate matters relating to conflicts of interest or ethics.
- At the onset of the Clinton administration, Department of Energy (DOE) Secretary O’Leary testified that the Department lacked the capacity to manage its contractors.
- In Lodge 1858, AFGE vs. Webb, there was apparent conflict within the National Aeronautics and Space Administration (NASA) Enabling Act, which provided that federal employees would perform NASA’s basic work, but capped their number, and then provided broadly for the deployment of contractors. The Court of Appeals observed that NASA “resorted to support service contracts as the alternative means of overcoming the civil service personnel ceilings.”

e. A Brief History of Conrail (Federal Government Corporation success story, see Appendix J for a discussion on FGCs)

- Conrail began operations in April 1976, although its origins go back to the earliest days of railroading in North America. The oldest segment of what became Conrail was the Granite Railway Co., built in 1826 to carry granite blocks for the Bunker Hill Monument in West Quincy, Massachusetts. Nearly 150 years later, scores of railroads in the northeast and Midwest had been acquired or merged into six different lines: Central Railroad of New Jersey, Erie Lackawanna, Lehigh & Hudson River, Lehigh Valley, Penn Central, and Reading.

- In the early 1970s, one by one, these six railroads entered bankruptcy. Although there were many reasons for the economic difficulties they faced, chief among them was competition from trucks, subsidized by the federally-built interstate highway system, and an archaic system of economic regulation which prevented railroads from responding to the needs of the market. As freight revenues declined, railroads deferred maintenance, allowing tracks and equipment to fall into poor condition, and as service levels deteriorated, more business went to trucks. Requirements to run money-losing passenger service added to the rails decline.
- The federal government, recognizing the national economic importance of the six railroads, responded by creating Conrail and appropriating the funds needed to rebuild tracks, locomotives, and freight cars. While Conrail succeeded in rebuilding the railroad, the problem of severe economic regulation remained. With the passage of the Staggers Act in 1980, many of these constraints were loosened, giving railroads more freedom to compete with trucks. Later, other legislation transferred the burden of operating money-losing commuter rail service from Conrail to state agencies. (In the 1970s, Congress created Amtrak to take over intercity passenger service from the nation's freight railroads.)
- By 1981, Conrail began its financial turnaround. After June 1981, Conrail no longer required federal investment and finished the year with the first profit in its history.
- With Conrail continuing to succeed in providing high quality service for its freight customers and improving its financial outlook, the federal government sold its ownership interest in Conrail through what at the time was the largest initial public stock offering in the nation's history. The March 26, 1987 transaction, with added cash payments from Conrail to the US Treasury, produced about \$1.9 billion for the taxpayers and returned the northeast-midwest rail freight system to the private sector as a for-profit corporation, as Congress had envisioned when it created Conrail as the Consolidated Rail Corporation.
- Through its 1987 initial public stock offering, Conrail shares were brought to market at a split-adjusted equivalent of \$13 per share. When Conrail was sold to CSX Corporation and Norfolk Southern Corporation in 1997, the price was \$115 per share. Under the operating plan approved by the US Surface Transportation Board in July 1998, CSX and Norfolk Southern began operating most Conrail lines and facilities on June 1, 1999. In much of New Jersey and portions of the Philadelphia and Detroit metropolitan areas, however, some lines and facilities remain under Conrail's control to manage and operate. Both CSX and Norfolk Southern, with Conrail acting as their local switching and terminal management agent, can serve customers along those lines.

APPENDIX H A COMMENT ON PRIVATIZATION

It appears that inefficiencies and excess capacity exist within the current industrial base. One proposed solution to this situation is privatization of government assets. Both the virtues and perils of privatization are extolled in the current literature. In an effort to objectively present these two opposing positions, a summary of articles that represent both viewpoints is provided.

The U.S. General Accounting Office (GAO) states that privatization is a viable option but it should be approached carefully, allowing for evaluation of economic, readiness, and statutory requirements that surround individual workloads at any facility under consideration for privatization. Privatizing activities, if not effectively managed, including the downsizing of remaining DOD infrastructure, could exacerbate existing capacity problems and the inefficiencies inherent in under-use of capacity.¹

In a separate report, the GAO states that competitive sourcing competitions are likely to produce savings, but caution should be observed in estimating the magnitude of those savings. Where DOD has documented post competition results, savings have been primarily the result of closely examining the work to be done and reengineering the activities to do them with fewer personnel, whether in-house or outsourced.²

Thomas G. McInerney, Lieutenant General, USAF (Ret), President and CEO of Business Executives for National Security (BENS), presented a statement before the National Defense Panel of the Quadrennial Defense Review in April 1997. In this statement, Mr. McInerney made a strong case for why the Pentagon should privatize. The BENS statement will refocus the debate toward correcting the imbalance in our force structure to infrastructure ratio - the real problem of tooth to tail - with savings redirected to force modernization. The need for the Defense of Department (DOD) to fix the way it manages its service and support infrastructure has never been more acute. Achieving a balance between the tooth to tail ratio will involve adjustments in the organization of the support infrastructure and in the way the Pentagon does business. Mr. McInerney stated,

“...that the solution lies in showing the Pentagon how it can get better, more efficient, services and support - at lower costs - by employing techniques pioneered in America's private sector. In the private sector, privatization has emerged as management innovations that promote efficiency and improve service. Faced with a 'competitiveness crisis' in the 1980s, American industry restructured and reengineered itself and is now the envy of the world. These experiences offer useful lessons for the Department of Defense.

¹U.S. General Accounting Office, Report to Congressional Requesters. *Army Depot Maintenance: Privatization Without Further Downsizing Increases Costly Capacity*. GAO/NSIAD-96-201 (Washington D.C.: September 1996). Page 4.

²U.S. General Accounting Office, Report to the Chairman, Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate. *DOD Competitive Sourcing: Results of Recent Competitions*. GAO/NSIAD-99-44 (Washington D.C.: February 1999). Page 4.

To restore balance to its tail-to-tooth, the Pentagon needs to turn to quality providers in the private sector to take over much of its commercial-type activity.”³

The BENS group states that DOD should focus on ‘core competencies’ and outsource activities not critical to its mission. Though there are impediments to restructuring and privatizing, the options should still be pursued. Privatizing will do much more than improve the quality of services provided to the DOD. The real allure of privatizing lies in the huge dollar savings that could be generated through a smart restructuring strategy. In conclusion, Mr. McInerney states,

“Real and effective restructuring requires giving up control and the temptation to micromanage processes. It means becoming a world-class consumer of best-in-class products and services. If the Defense Department wants the full benefits of private sector experience--that is, competitive, efficient and cost effective processes--it must be willing to cede ownership and control of its service and support infrastructure and let the free enterprise system meet its needs.”⁴

The 1996 report *Pathway to Privatization – An Industry Perspective*, published by the California Trade and Commerce Agency, supports the impetus for moving service capability to the most effective provider who, unlike in the past, is no longer assumed to be a federal entity. The report states industry’s opinion that the marketplace will always provide taxpayers a better return on their investment than that provided by the government. Private industry encourages the government, at all levels, to pursue privatization alternatives. This report sees people as the most intractable obstacle to overcome in the push for privatization; that federal employees fear change, have great concern for an unknown future, and possess strong philosophical reservations about the wisdom of turning over military-essential work to a profit-driven private sector.⁵

In the article *Department of Defense, Inc., Are We Ready To Become An Extension Of Corporate America*, written by LTC William D. Beatty, III, he extols the virtues of privatization and outsourcing as a source of revenue for DOD to use towards modernization. The article’s abstract states,

“Americans are always looking for ways to improve government services and lower costs. Therefore, it is imperative to examine the boundary between the government and private industry conveyance of goods and services. Privatization and outsourcing may enable the Department of Defense (DOD) to effectively modernize and sustain support for the warfighter at a reduced cost to the taxpayer. From the policy guidance depicted in the OMB Circular A-76 to the influence from the Administration and Congress, the DOD must consider a multitude of

³ Statement of Thomas G. McInerney, Lieutenant General, USAF (Ret.), Former President and CEO, BENS before the National Defense Panel of the Quadrennial Defense Review pursuant to the Military Force Structure Review Act Of 1996. Available at http://www.bens.org/other_0497.html.

⁴ *ibid*

⁵ Report of the California Chief Executive Officers’ Defense Privatization Task Force to Governor Pete Wilson: *Pathway to Privatization—An Industry Perspective*, California Trade and Commerce Agency (Sacramento, Cal.: Mar. 1996), p. xix.

issues and develop strategies to transfer functions to the private sector. This paper investigates and summarizes the positive impacts of these options on the DOD.”⁶

The article states that defense officials must constantly seek more effective and efficient means of meeting noncore obligations, which equates to private sector businesses. Competition and privatization offer the prospect of lowering costs and improving performance across a wide range of support activities. LTC Beatty further states that changing a governmental enterprise to private ownership generates greater accountability than the government process. Industry gains the flexibility to make innovative infrastructure investments to enable significant efficiency enhancements. Private owners risk their own money instead of taxpayer dollars. Therefore, they have stronger incentives to provide quality service at attractive prices. If a firm fails to do so, the customers will stop buying or turn to other competitors. If the firm is a government contractor, it may risk losing the government’s business once the contract expires. LTC Beatty concludes the article by stating, “DOD’s overarching goal is to maintain and improve long-term military readiness and to ensure the Department addresses modernization needs. Privatization will enable the DOD to effectively modernize and sustain critical systems in support of the warfighter at a reduced cost to the taxpayer.”⁷

Mr. Paul Starr, in his article entitled *The Meaning of Privatization*, has a personal aversion to privatization. He states that “*Privatization* is not only a policy; it is also a signal about the competence and desirability of public provision. It reinforces the view that government cannot be expected to perform well.” The perception that private means better may be the result of long-existing restrictions on the scope and quality of public provisions due to the fact that public services are frequently restricted to functional minimums. The restricted quality of public provision is, therefore, a self-reinforcing feature. Mr. Starr points out that “privatization advocates raise questions exclusively about the adequacy of the public sector; the comparable questions about the private sector do not receive the same attention.” As public provisions are moved to the private sector, there is a corresponding move from the realm of open and visible into a domain that is more closed to scrutiny and access.⁸

In the article *The Case Against Privatizing National Security*, Ms. Ann Markusen reiterates that it is competition, not privatization, that induces better quality services at more reasonable costs if (1) at least three competitors exist, (2) competition exists over time, (3) clarity of task and performance requirements are articulated and (4) active and sustained monitoring of the activity by the government can be maintained. A disadvantage of privatization could be the potential for corruption and capture of public decision making by politicians. No one has been able to evaluate fully the long term costs and consequences of extensive privatization of national

⁶ Beatty, William D., III; Army War College Carlisle Barracks, PA. *Department of Defense, Inc.: Are We Ready To Become An Extension of Corporate America*, April 7, 1999. Available at <http://www.stormingmedia.us/cgi-bin/87/8792/A879263.php>

⁷ *ibid*

⁸ Paul Starr, “The Meaning of Privatization,” *Yale Law and Policy Review* 6 (1988): 6-41. This article also appears in Alfred Kahn and Sheila Kamerman, eds., *Privatization and the Welfare State* (Princeton University Press, 1989). Available at <http://www.princeton.edu/~starr/meaning.html>

defense, and the sheer inability to do so should give advocates of outsourcing anything other than the most routine functions pause.⁹

Also, further privatization must be weighed against both the expense of oversight and the likely erosion of competence needed to monitor the supplier and the service adequately. Once a function is privatized, there is nothing to ensure that the government will retain the ability to bring such work back in-house, nor is there evidence that the Pentagon is committed to ongoing evaluation of outsourced activities. Even the best evaluations are confined to economic and technical matters and do not attempt to assess the larger political dangers and feedback effects of increasing reliance on for-profit firms for national defense. The potential exists for heightened contractor influence over military policy through lobbying and campaign financial support of presidents and members of Congress.

Finally, the US has evolved a mixed public/private defense establishment that is at least marginally transparent and cultivates an arms-length relationship. The consequences of greater privatization, if accompanied by eroding public sector capability and gutting the regulatory mechanisms with which the Pentagon disciplines the potential excesses of the profit motive could be devastating.¹⁰

Reinventing Government by David Osborne and Ted Gaebler is the epitome of discourse on what is wrong with government and how to fix it. In this book, the authors advocate the marketizing of government based on a pessimism about the possibility of citizens acting in concert to direct governmental activity, or of public sector managers and employees revitalizing bureaus from within. The article, *Can Markets Govern?*, in which Ms. Roberta Lynch reviews this book, takes issue with many of the tenets the authors put forward. "Of all *Reinventing Government's* clever aphorisms, 'Government should steer and not row' is probably the most oft-cited. But its catchiness belies a seriously flawed argument for marketization."

Ms. Lynch points out that the authors do not confront the issue of government oversight for privatized functions. For instance, the Pentagon has historically contracted out weapons development and production, and the results have been far from salutary. Cost overruns have been enormous and chronic corruption is not unprecedented. Ms. Lynch goes on to say that contracting out is no guarantee for efficiency. Frequently, only a small number of bidders compete, which creates a less than fully competitive situation and sets the stage for potential monopolistic profits. Total costs to the public sector may actually rise because private contractors demand profits and the cost to oversee the service provider still a costs to the government.

Though it is rarely addressed in the literature, contracting out offers a way to bypass fair labor standards. Minority groups and public sector unions have helped create a work force that addresses diversity in the work place, standardization of pay and protection against arbitrary firings. Unfortunately, the private sector increasingly relies on low-wage, no-benefit policies to give them the competitive edge when bidding for government contracts. The records of private

⁹ Markusen, Ann "The Case against Privatizing National Security." Working Paper, submitted to *Governance*, June 2001. Available at <http://www.gao.gov/a76panel/forthecord/amarkusenpaper.pdf>

¹⁰ *ibid*

enterprises are rarely mentioned when privatization is touted as the solution to improving government services. Ms. Lynch states, "Giant firms fail to pay their taxes, cheat on government contracts, bilk their customers and make false advertisements. Nor are private corporations perfect models of efficiency." There are numerous examples in the business pages of waste and mismanagement at companies like General Motors, Lockheed Martin and Enron, despite the competitiveness of their business environment. Conversely, there is benefit in the accountability and durability of public sector service providers. Their financial statements are public record and they must abide by a set of procedures designed to discourage corruption, favoritism, prejudice, and arbitrariness.¹¹

Conclusion:

There may be savings and/or higher productivity to be gained from further Pentagon privatization. But advocates have not supported their case with hard evidence, especially given the complexity of the national security mission. Few studies try to disassociate the logic of private versus public; most rely on an assertion of the superiority of the private sector.

On the other hand, some of the arguments for privatization do have merit. The Army should fully review privatization proposals.

¹¹ Roberta Lynch, "Can Markets Govern?," *The American Prospect* vol. 5 no. 16, December 1, 1994 . Available at <http://www.prospect.org/print/V5/16/lynch-r.html>

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APPENDIX I DETERMINING THE FAIR MARKET VALUE OF GOVERNMENT INDUSTRIAL FACILITIES¹

“There is nothing so dangerous as the pursuit of a rational investment policy in an irrational world.”

John Maynard Keynes

I.1 Introduction. The Federal Government is required to obtain a “fair market value” when it disposes of assets (e.g., industrial property, equipment, and land). This appendix describes what constitutes fair market value and how the Army can determine it using a commercially accepted methodology for the valuation of said assets. These types of valuations are essential when considering Army stationing alternatives, potential disposals or re-planning of installations, public-private partnerships (PPPs), or privatizations of productive assets, because they provide a benchmark against which the value of other options can be compared.

Typically, a fair market valuation is an appraisal conducted for a change of ownership situation. “Fair market valuation” is defined by the American Society of Appraisers (ASA) as “the amount expressed in terms of money that may reasonably be expected between a willing buyer and willing seller with equity to both fully aware of all relevant facts as of a specific date.” And, according to lectlaw.com, fair market value is defined as “the price (cash or equivalent) that a buyer could reasonably be expected to pay and a seller could reasonably be expected to accept, if the business or its assets were for sale on the open market for a reasonable period of time, both buyer and seller being in possession of all pertinent facts, and neither being under any compulsion to act.”²

Valuation firms prepare a comprehensive opinion of a company’s fair market value, based on the economic and market conditions and the condition of the company as it existed as of the date of the opinion. The opinion discusses the selection and calculation of performance indicators and multiples, offers detailed information regarding comparable companies and comparable transactions, and relates the conclusions of the valuation firm’s due-diligence review. The fair market value for the enterprise on both an aggregate basis and a per share basis is delivered subject to the conditions and scope of the engagement. The valuation firm generally makes a detailed presentation that demonstrates the findings and conclusions of the analysis to concerned parties.

One cannot help but notice the inclusion of the word “market” in fair market price, which is key to the valuation of any business or asset. The market for the outputs of the business or its assets must be evaluated to determine their profit-generating potential. Both the purchaser and seller should (1) perform market research to determine whether a market exists for the product/service, (2) the ease by which the business can serve the markets, and (3) their relative competitiveness. For Army assets, the market for both the current and potential output from any facilities

¹ This appendix was a joint effort between CAA and Price Water House Coopers Securities and IBM Business Consulting Services

² www.lectlaw.com

(including industrial equipment/tooling) and the real property (land) should be analysed, to determine the fair market value for the assets in their geographical location. In addition, for multiple locations, market research should be conducted to determine what the market is for the portfolio of assets (as a whole or segmented).

Business valuation should be considered a starting point for buyers and sellers. It is rare that buyers and sellers come up with a similar figure, if for no other reason than the seller is looking for a higher price. The Army's goal should be to determine a ballpark figure from which the buyer and the Army (seller) can negotiate an acceptable price. The Army should review the valuations, but keep in mind that Army installations are complex assets. Due to this complexity, this appendix focuses on one type of installation, industrial, but the concepts within apply to all types of Army installations.

As indicated in Figure I-1, the valuation of the Army's industrial installations should involve a three-stage process:

- Stage 1. Conduct market research and obtain the information required in order to complete the valuation and plan for the transaction.
- Stage 2. Conduct the valuation.
- Stage 3. Prepare for the transaction with an implementation plan.

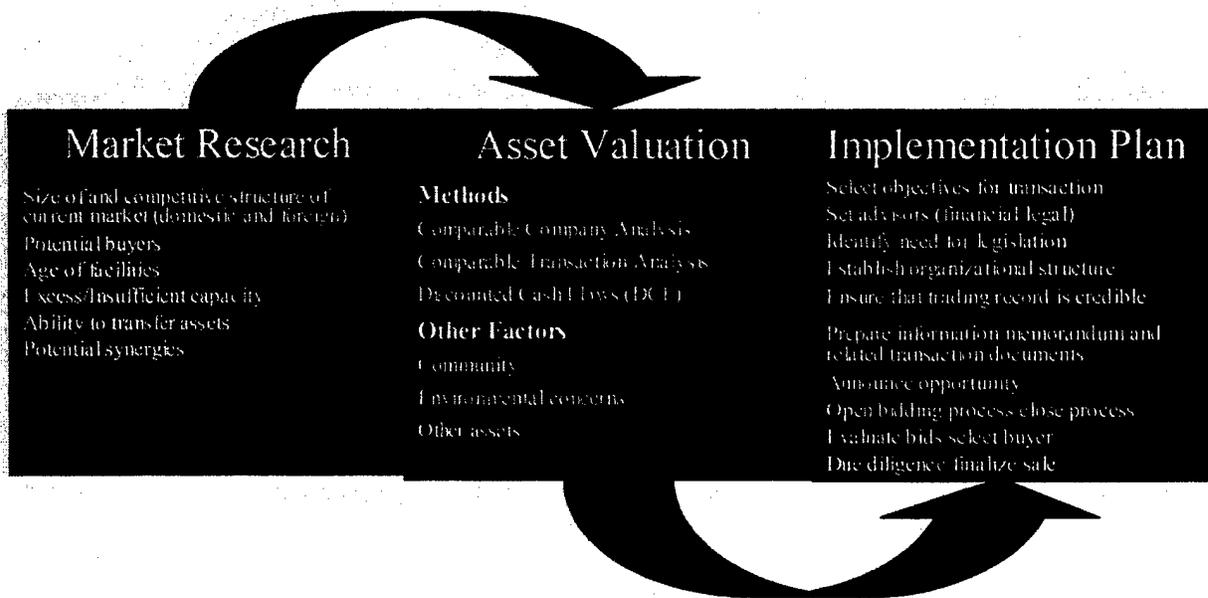


Figure I-1. Valuation of Government Industrial Assets

Each of these stages is described in further detail in the following sections.

I.2 Market Research

A comprehensive market research effort will include (but is not limited to) the following topics³:

- Historic, current, and forecast financial performance for the enterprise being valued
- Size of the current market [domestic (organic and inorganic) and foreign]
- Growth potential (based on requirements or other modeling techniques), potential threats to revenues/profitability, and alternative uses of facilities or assets
- Competitive positioning of the industrial facility within the market
- Potential buyers
- Current and future excess/insufficient capacity
- Age and condition of facilities
- Ability to transfer assets among (and within) facilities
- Capacity utilization of the market's assets (government owned and privately owned)
- Synergies between assets
- Environmental liabilities
- State and local tax laws
- Legal and regulatory requirements
- Real Estate and Personal Property values

Clearly, where there is a single dominant customer for the outputs of the facility, like the US government, that customer's requirements and buying behaviours will significantly influence the business's value. Therefore, in valuing strategic assets like the Army industrial base, where the Army and other US agencies are the principal customers, market research seeking to identify such customers' short-, medium-, and long-term requirements; their buying behaviours; and their willingness (or otherwise) to continue to commit to purchase the outputs from the facility being considered, will play a critical role in the valuation process.

The analyst should consult trade publications and information sources, government reports or websites, financial statements, etc. For example, analysts can access the website www.usatrade.gov to obtain country commercial guides and industry sector analyses (market potential, market size, and competitors). They may also conduct interviews with suppliers and customers—all in an effort to determine the size of the current and future market. The analyst may also consult specific financial and market information for an industry sector to determine the relative financial performance of the company compared with its peers.

Analysts should also seek information about current producers and their production capacity. If insufficient capacity exists to meet market demand, firms will have an incentive to make capital investments (and receive a high return on assets). In a related matter, synergies among portfolios of assets might be identified, thereby reducing the need for future capital investment (possibly increasing the value of the current assets). However, if excess capacity exists, the number of

³PricewaterhouseCoopers Securities LLC, An Introduction to Valuation Analysis, 1998, PWC Publishing, & IBM Business Consulting Services Functional Business Case Analysis Methodology., 2002.

potential buyers and therefore the fair market price will be lower and possibly provide a disincentive to invest new capital.

State and local tax laws can influence the value of Army assets from the purchasers' perspective. Such laws can be complex and should be investigated; lessons learned should then be in the valuation phase.

Environmental liabilities at Army installations, and industrial facilities in particular, can have a significant impact on valuation and a company's willingness to enter a purchasing agreement. Such liabilities can overwhelm all other considerations and should be researched in detail. From the Army's perspective, it needs to define the financial and legal liabilities, determine a mechanism to transfer future financial liability, and examine future cost risk due to changes in ownership.

The final market research topic is legal and regulatory requirements/issues. Analysts need to understand the political environment for the market in question to include current and pending legislation to determine whether regulations are being lifted (e.g., airline industry) or whether additional restrictions are being imposed that will affect the marketability of the assets.

This research seeks to test the robustness of the financial forecasts provided by the company's management and, in particular, to identify whether there are: ⁴

1. ***Any significant risks to either revenue or cost projections*** – For example, a valuation of a shell-manufacturing facility whose principal customer is the US Army should seek to take into account the impact that any planned changes to the Army's equipment or operational and training philosophy could have on the demand for its products and any need to retool [hypothetically, if the Army changes to Global Positioning System (GPS) guided shells, the total number of shells that it requires could be reduced considerably].
2. ***Relative performance and competitiveness issues*** – that could weaken or strengthen the competitive position of the facility and the profitability of the sector. The Porter 5 Forces Analysis provides a good framework for this type of appraisal. ⁵
3. ***Impacts relating to changes in government policy*** – that could weaken or strengthen the market. For example, in July 1993, the government introduced two policy reforms: acquisition reform and industry consolidation. The first reform allowed industry and the government to share cost savings as a result of improved efficiencies. The second encouraged corporate consolidations. Then in 1998, the government reversed both policies. ⁶

After completing the market research phase, the analysis team begins the valuation process. Upon completion of the valuation, the decision makers should have the information they need to

⁴ PWC Introduction to Valuation Analysis

⁵ Michael E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (Simon & Schuster Adult Publishing Group, 1998).

⁶ John Deutch, "Consolidation of the US Defense Industrial Base", *Acquisition Review Quarterly*, Fall 2001, p.137.

decide whether to proceed with the sale. If the decision makers decide to proceed a team will develop an implementation plan.

I.3 Valuation

Valuing a company (Army facility) is hardly a precise science and can vary depending on the type of business and the reason for determining a valuation. A wide range of factors goes into the process, from the book value to a host of tangible and intangible elements. In general, the value of the business will rely on an analysis of the company's cash flow. In other words, its ability to generate consistent profits will ultimately determine its worth in the marketplace as well as its real and personal assets.

The asset valuation for Army facilities should be divided into two components:⁷

- Going-concern valuation of the enterprise (business assets)
- Asset valuation of the underlying property (real estate and personal property)

The valuation should bring together these components under a framework that reflects the Army's transaction objectives. Two possibilities:

- If the Army is indifferent to what happens to the facility, its employees, or its outputs after the sale has been completed, then the sale would be unencumbered, and the valuation should identify the maximum value for the enterprise or its underlying assets, given its current or any other potential use. Where land value is very high and the current use value is low, it is probable that an acquirer would seek to reuse the land for a more profitable purpose.
- If, for example, the Army is interested in the price and availability of the outputs of the facility, then it is likely that the transaction should include a service-level agreement for those outputs. This agreement, the business it secures, and the constraints it imposes could have a material impact on the valuation by limiting the acquirer's ability to put the assets to more profitable use.

An example of this would be a water supply network on an Army installation where the acquirer is restricted to providing services only to occupants of the installation. In this case, the value of the opportunity depends on the level of profit the acquirer would be able to make from the on-base users over the term of its ownership, the investment it is required to make, the liabilities it has to take on as part of the acquisition, and the profits it can make selling off surplus infrastructure. The fair market value of such an opportunity could be zero or even negative, because the profit potential will be determined by the price that competing service providers wish to charge to provide the service. However, if the acquirer could levy charges in accordance with standard industry practice and maximize its returns by selling services to third

⁷ PWC An Introduction to Valuation Analysis page 8

parties not on the installation, the fair market value would include allowance for these additional profits.

a. Going-Concern Valuation of the Enterprise (Business Assets)

When an enterprise is valued as a going concern it is assumed that the company will continue operations indefinitely (will not go out of business and liquidate its assets). The difference between the liquidation value and the going-concern value is the value of intangibles associated with the running of the business, such as goodwill and intellectual property, and the value that is attributed to assets where their book value is different from their individual maximum open market values.

There are three generally accepted methods that the Army can use to value a business:⁸

- Comparable Company Analysis
- Comparable Transaction Analysis
- Discounted Cash Flow (DCF) Analysis

These methodologies provide the basis for a value range, which may be expanded or refined as a result of other factors [community-related issues (e.g., taxes), environmental concerns, and value of other assets (e.g., permits and licenses)]. All three methods are used in executing a proper and complete asset valuation and their results should be compared. However, the DCS focuses on the organization's cash flow and some weight this methodology more highly than the other approaches. Regardless, each method has its limitations; a complete, proper asset valuation would include all three methods and their results compared. Army industrial facilities may not have accurate or current financial accounts and forecasts that can be used as the basis of a valuation. In these cases, a statement often has to be developed as part of the initial research phase. Government-owned and Contractor-operated (GOCO) facilities should have (at a minimum) basic financial statements for the operations of the facility; however, they are likely to have inadequate balance sheet information. A Government-owned and Government-operated (GOGO) facility have even less information available

1. Comparable Company Analysis

Comparable Company Analysis is a means of comparing the relative value of companies with similar lines of business by identifying a common indicator of value. It is believed that the conditions and prospects of companies in similar lines of business depend on a common set of factors, such as overall demand for products and services, market growth, and industry outlook.

Buyers and sellers determine the fair market value of a public company with their decisions on publicly traded securities. These minority-interest values can easily be determined and can be adjusted for control premiums. Because there are usually several public companies that are similar to any given private company, the fair market value of comparable companies can generally be compared with the fair market value of the private company.

⁸ PWC Securities An Introduction to Valuation Analysis page 1

Comparable Company Analysis is universal and a useful starting point in the valuation of a company, but it has significant limitations, particularly where the asset being valued is a closely held private or government-owned entity. A Comparable Company Analysis, commonly referred to as "comps," is a valuation tool used to compare a company with similar companies that are publicly traded. A comps model surveys a group of similar publicly traded companies to establish a relationship between the market price of each company's securities and its respective operating performance and financial condition. The methodology assumes that the best indicator of "value" of a company is the current price of its equity securities and that similar companies trade on certain "multiples." Typical valuation benchmarks include multiples of price/earnings (P/E), enterprise value/revenues, enterprise value/EBITDA, and enterprise value/EBIT.⁹ The most common valuation multiple is P/E; however, its usefulness depends on the type of business and the methodology being used.

Comps valuation analysis is a difficult and subjective process. Because no two companies are identical, one must value a company relative to its peer group, taking into account differences in business, size, profitability, and growth prospects, as well as intangible differences such as reputation and brand equity. For example, one must consider the location and type of assets being valued. Are they specialty assets mainly in remote locations that will not be easily tradable (typical for Army industrial facilities), or are they assets for general use and located in urban areas?

Market capitalization can be compared only with operating statistics that take a company's debt and preferred dividend obligations into consideration. Hence, market capitalization is compared with:

- Net income (net income available to common shareholders)
- Tangible book value (shareholders' equity plus preferred stock, less intangible assets)
- Free cash flow (net income available to common shareholders plus depreciation, amortization, deferred taxes, and any other noncash items)

Subjectivity and uncertainty within the analysis increases when dealing with Army industrial facilities because there currently are no shareholders or preferred stock and valuing the intangibles (reputation, etc.) is difficult, albeit not impossible. Furthermore, the book value for some government assets (especially unique military systems) would need to be determined.¹⁰

2. Comparable Transaction Analysis

A company that has recently sold all, or a large portion, of its equity provides an immediate indication of value. Its performance indicators can be used as a benchmark from which to measure a similar private company's fair market value. Comparable Transaction Analysis derives implied valuation multiples from information on recent acquisition transactions of

⁹ Stephen A. Ross, Randolph W. Westerfield, Jeffrey Jaffee, *Corporate Finance* (The McGraw-Hill Companies, 2001).

¹⁰ Introduction to Valuation Analysis page 9

companies that have similar lines of business. These multiples can then be used as a gauge to determine the perceived value of one or more companies operating within the same industry.

A Comparable Transaction Analysis values a company by referring to prices paid in prior acquisitions of similar businesses. The primary objectives of this analysis are the following:

- To estimate the value of a company.
- To incorporate additional market factors into the valuation estimates. Three examples:
 - Recent deals reflecting the influence of current mergers and acquisitions; market's supply and demand for assets.
 - Values paid to acquire a controlling interest of a business.
 - Premiums paid, over and above the estimated value of a company.

The analysis also provides a history of selected transactions either in one particular industry or in one area where acquired companies have relatively similar characteristics in terms of economic drivers.

The first step with comparable transactions is a review of the prices at which similar companies have recently sold. The difficulty with this approach is twofold. First, because of the nature of Army industrial facilities, it is often difficult to find similar companies that have sold recently. Second, the price for a transaction involving closely held businesses is often secret, and even if known, the real "price" may be a combination of cash, personal service contracts, and covenants not to compete, making it difficult to compare with a potential Army transaction.

The analysis derives pricing benchmarks based on selected transactions. The analysis compares the transaction value paid for selected companies in the given industry with the respective companies' financial results to determine transaction multiples. Typical benchmarks include multiples of:

- Net income
- Book value (transaction or equity value multiples)
- Revenue
- EBITDA
- EBIT
- Assets value

Transaction multiples define the prices that acquirers are willing to pay for companies. By applying transaction multiples to the financial results of the company being analyzed, it is possible to determine a range of value. In contrast to the Comparable Company Analysis, this approach is generally based upon multiples paid for control of a company, (i.e., including a "control premium").

Comparable Transaction Analysis appears to be a straightforward methodology, but has its difficulties:

- Past transactions are rarely totally comparable.
- Mergers and acquisitions cycles can cause distortions in historical transaction values.
- Transaction information is often very difficult to obtain or, in most cases, incomplete.

Calculated implied value ranges are usually extremely wide and inconclusive. Therefore, analysts should seek transactions and target company characteristics similar to those being valued in the transaction and focus on the transactions most comparable to the facility being valued, based on:

- Industry/geographical markets
- Size and business mix
- Financial performance (growth rate, margins, return on equity, risk profile)
- Deal Background

Among the best sources of information for publicly held firms are:

- SDC (Securities Data Corporation)
- Previous Comparable Transaction Analyses
- Company and industry research reports
- News articles
- Annual report, 10K, and 10Q
- Other official filings (8K, proxy, registration statement/prospectus, 13D, 13E-3, 14D-1, 14D-9, other tender officer documentation)
- Others (ratings agency reports, trade publications, etc.)

Analysts may find it even harder to locate comparable transaction data regarding Army industrial assets because the number of privatizations or dispositions is very small. The Army can, however, obtain historical data regarding such transactions in other countries or related industries here or abroad.

Once the Comparable Transaction Analysis has been completed, it should be adjusted to take account of factors such as urgent investment requirements, community needs, and other concerns (e.g., corporate tax exemptions, environmental costs or liabilities), and the value of intangibles (e.g., permits/licenses).¹¹

3. Discounted Cash Flow Valuation

Another determinant in a company's value is the anticipated cash flow. Discounted Cash Flow analysis is a valuation method that isolates a company's projected cash flow that is available to service debt and provide a return to equity; the net present value of this free cash flow to capital is computed over a projected period, based on the perceived risk of achieving such cash flow. To take into account the time value of capital, it is typically appropriate to value the company's cash flows using a discounted cash flow approach.

¹¹ Introduction to Valuation Analysis page 64

A DCF valuation is a key approach (where the information required is available) to estimate the fair market value of the common stock of a business based on the value of the cash flows that the business expects to generate in the future.

A DCF valuation is only as accurate as the projections used, and results are very sensitive to the assumptions used—in particular, the business (sales growth, EBIT margin, tax rate, capital expenditures, increases in net working capital, etc.) and financial assumptions (discount rate, perpetual growth rate, etc.). Particular care should be given to the calculation of the terminal value (the value of the business, based on the future cash flows, at the end of the projection period) of the facility, because it often represents a very substantial part of the value. DCF valuation:

- Allows the expected operating and transition strategy to be incorporated into a mathematical model.
- Recognizes the time value of money.
- Establishes the “intrinsic value” of the operating assets of a company.
- Provides a range of value.

A DCF valuation yields the value of the business, regardless of how it is capitalized and should be presented as a range of values, not a point estimate. In fact, current best-practice valuations use Monte Carlo simulation techniques and decision tree-style scenario analyses to quantify more precisely the impact that such uncertainty has on the range of potential valuations. Therefore, an analyst should use several scenarios about the future (operating and financial sensitivity analyses) to estimate the entity’s DCF value and highlight all assumptions.

A DCF valuation involves four steps:

- Estimate the future cash flow available for dividends (the free cash flow after debt services) for a discrete projection period
- Estimate the residual or terminal value of the enterprise or assets at the end of the projection period
- Discount both to their present value at a rate of return that takes account of the relative risk of achieving the cash flows and the time value of money
- Combine the present value of the residual cash flows with the projection period to indicate market value

Ideally, the projection period for an Army industrial facility would cover at least a full business cycle and the period of transition from the current operation to steady-state operation following a transition period. Where the business has a definite life, as opposed to an indefinite life, such as is found where concessions are granted (for example, to operate a water facility for a defined number of years), then the projection period should cover the whole of the definite life. Where the business is expected to change significantly or require a program of significant operational changes and capital expenditures/investment, then the projection period should extend beyond these until stability is expected.¹²

¹² An Introduction to Asset Valuation page 48

b. The Projected Unleveraged Free Cash Flows of the Enterprise over the Projection Period

An example of an unleveraged free cash flow structure used in a DCF valuation is at Figure I-2.

In developing the unleveraged free cash flow for the company, we take full account of any liabilities and when they may fall due, recording them as either operating expenses or capital expenditures. Factors such as urgent investment requirements, community needs and other concerns (e.g., corporate tax exemptions, environmental costs or liabilities), and the value of intangibles (e.g., permits/licenses) should be quantified and included in the free cash flow.

Total Sales
- <u>Cost of Goods Sold</u>
Gross Operating Margin
- Operating Expenses (excluding <u>Depreciation and Amortization</u>)
Earnings before Interest, Tax Depreciation, Amortization
- Interest
- Taxation
- Capital Expenditures
- Movements in Working Capital
+ Receipts from Sale of Assets
+ <u>Other Income</u>
Unleveraged Free Cash Flow

Figure I-2. An Example of an Unleveraged Free Cash Flow

Ideally, all revenues and expenses will be presented as cash movements; however, because US Generally Accepted Accounting Principles (GAAP) deal in accruals, the Movements in Working Capital also has to be included, but non-cash provisions should be deducted from such adjustments. ("Movements in Working Capital" is simply the increase or decrease of working capital in the current year from the prior year.)

A best-practice approach would involve the development of a business model, which generates a balance sheet, profit and loss statistics, and cash flows for the whole of the projection period, so that working capital movements and the impact of distribution constraints can be considered in the valuation. However, it is not always possible to obtain such detailed information. If projected balance sheet data is provided, working capital can be calculated as the sum of total current assets less total current liabilities:

$$\text{Working Capital} = \text{Total Current Assets} - \text{Total Current Liabilities}$$

If projected balance sheet data is not available (Army financial statements may not have been developed for the specific entity), working capital can be approximated by taking a historical average of working capital and using the ratio of that average to sales to make forward

assumptions. The analyst will need to identify all the relevant estimated receivables/revenues and expenses for the projection period and when they will occur (e.g., sale of facility) and then calculate the projected unleveraged free cash flows of the company. These cash flows are then discounted using the relevant discount factor to yield the company's asset value of the firm (prior to adjustments for non-operating assets/liabilities). The discount factor used in valuations is the company's Weighted Average Cost of Capital (WACC) and other investments of equivalent type and risk.

c. The Weighted Average Cost of Capital (WACC)

The WACC reflects the opportunity costs to all the capital providers weighted by their relative contribution to the total capital of the company. The opportunity cost to any investor equals the rate of return that the investor could expect to earn on other investments of equivalent risk.

The WACC formula follows¹³:

$$\text{WACC} = E/(D+E) * r_e + D/(D+E)*(1-t) * r_d$$

E = market value of equity

D = market value of debt

r_e = cost of equity

t = company marginal tax rate

r_d = cost of debt

Where the business has no capital structure (i.e., no debt or equity), as is typically the case with Army assets, a preliminary capital structure has to be developed. Ideally, such a structure would be developed based on the investment requirements of the particular enterprise being valued. However, comparator data must also be obtained so as to understand the range of norms for capital structure and cost of funds in the marketplace. Where the company is particularly large, corporate financiers and valuation analysts have worked with rating agencies, like Standard and Poor's and Moody's, to establish a shadow rating for the company and a target capital structure. The principle is that there is a natural tension between the level of financial leverage and the likely financial health of the business and therefore the cost of the debt. However, given that debt is almost inevitably a significantly cheaper source of finance (particularly because the interest is normally tax deductible) than equity, higher valuations can be obtained with higher levels of leverage. There does, however, come a point where too much debt increases the financial riskiness of the business, and the valuation reduces rapidly. Even where the business has an existing capital structure, valuation analysts should consider the impact that increasing or reducing debt levels has on the valuation. Ibbotson's cost of capital guide and the London Business School Beta service are reference sources to the actual cost of capital and cost of equity of almost all publicly traded companies on the New York and London Stock Exchanges, and they provide peer group and sector averages, which can be helpful comparators for the analyst to consider.

Once these numbers have been derived, the analyst can proceed with the DCF analysis. The valuation analyst should also examine the sensitivity of the valuation calculated under all three methods to the key assumptions used. As noted above, Monte Carlo analysis is now being increasingly used as a tool that allows the impact of uncertainty to be quantified. In addition,

¹³ Op. cit. Stephen E. Ross et.al., *Corporate Finance*.

where there are a number of significantly different potential outcomes, the analyst must determine the likelihood of each potential outcome. Typically, a decision tree method is used to combine the effect of the various scenarios (i.e., an assumption is made about the probability of each scenario occurring, and the combined probability of all scenarios is 100 percent). The sum of each scenario valuation multiplied by its probability of occurring is calculated to give a combined valuation.

Once the cash flows for each of the scenarios are developed, the analyst should step back from the numbers and conduct "sanity checks" on the assumption's implications. Almost all financial regulators and valuation associations advise that where valuations are particularly sensitive to key assumptions, the assumptions and their impact on the valuation when varied should be explicitly defined.

d. Terminal Value

The second component of value is the continuing or terminal value of the installation and asset past the terminal point of analysis, when the new company has reached a steady state. As stated previously, the terminal value is the value of the business, based on the future cash flows, at the end of the projection period.

There are three primary methodologies to calculate the terminal value:

- Exit multiples
- Perpetual growth in Free Cash Flow
- Break-up or disposal value

The perpetuity formula implicitly assumes that the buyer will own the company and be entitled to the cash flows into perpetuity (theoretically more correct than multiple approach), while the use of exit multiples assumes that the business is sold at the end of the projection period. The analyst must determine the most appropriate methods, given the transaction in question. For example, one would probably use a perpetuity formula for tradable assets that have good records and diverse customer bases; however, the tradability of Army industrial facilities is suspect. If, however, oversupply exists in the industry or there is a dominant customer (e.g., the government), usage of the valuation approach that takes account of the volatility of potential orders (exit multiples) may be more appropriate.

I.4 Break-up or disposal value

There are situations (e.g., excess capacity in the commercial sector or a lack of a market) where the buyer has no intent to continue the enterprise. Under these conditions, the value of the asset would become the value of the real and personal property. The value will need to take account of the maximum zoning value that could be obtained and the associated open market valuation for the land. It is generally possible to liquidate the assets of a company, and after paying off the company's liabilities; the net proceeds would accrue to the seller of the company/asset.

The valuation method focuses on only the market value of the property and is normally performed by certified real estate appraisers, in accordance with the Uniform Standards of Appraisal Principles. Real estate appraisers use three basic methods to determine the value of

investment real estate: the Cost Approach (depreciated replacement cost), the Market Data Approach (assessment of comparable transactions), and the Income Approach (discounted cash flow analysis of the incomes and costs). The methods are discussed below. (Note: Similar to the valuation of a going concern, the three methods are used to determine the value of the property, and they are correlated to reach a market price. However, like valuing a going concern where the DCF is the primary valuation method, the market approach remains the principal method used to value the property.¹⁴)

a. Cost Approach

The Cost Approach is the most involved. The property is broken down into three parts (land, site improvements, and buildings), and a replacement value is established for each part.

For instance, the analyst would accomplish the following steps:

- Determine the market rate per acre for comparable land in the area (city or county)
- Estimate the value of improvements (parking lots, landscaping, etc.)
- Estimate the replacement cost of building (including permanent fixtures) and factor in depreciation
- Sum the estimates for each part¹⁵

b. Market Approach

The Market Approach compares the use of area market data to compare the sale of the buildings with recent comparables. This may be difficult because it requires identifying comparable (Army industrial assets often can be unique) and recent (the market changes quickly) sales. Once the analyst identifies two or more comparable sales, he averages the sales prices and adjust this average (for inflation or size differences) to determine the market price using this approach.¹⁶

The analyst should realize that some markets would have a difficult time absorbing the amount of land to be sold. Consequently, the fair market price for the land can be significantly less than appraised value, in lieu of a plan to reduce the effect on the local economies and the sales price. Historically, this phenomenon was not fully addressed for previous disposals of Army assets, and some local economies have yet to recover (e.g., Tooele, UT). This approach is considered the most accurate for evaluating **nonincome-producing properties**.¹⁷

c. Income Approach

The Income Approach is considered to be the most accurate for evaluating **income-producing properties**; many lenders rely on this approach. The lenders (and the Army's asset valuator)

¹⁴ John Wiedemer, *Real Estate Finance*, (Prentice Hall, Inc.: Upper Saddle River, NJ, 1999) pp 191-192.

¹⁵ Wiedemer, pp 189-191.

¹⁶ Wiedemer, pp 191-192.

¹⁷ Commercial Real Estate Desk Book (CRED), Milt Tanzer, Published by Institute for Business Planning, IBP Plaza Engelwood Cliffs NJ. 07632, page 223, date of pub, 1996

will develop a discounted cash flow based on the incomes and costs associated with the property (the inflows and outflows may be estimates)¹⁸.

I.5. Value Range

Upon completion of the three valuation methods, we would use the results of each method to develop a value range, which will be the expected sales price for the installation. The analyst may need to adjust the range further because of other factors such as urgent investment requirements, community needs, other concerns (e.g., corporate tax exemptions, environmental costs or liabilities), and the value of intangibles (e.g., permits/licenses) that were not included in the DCF or the comparable analyses. Figure I-3 provides an example.

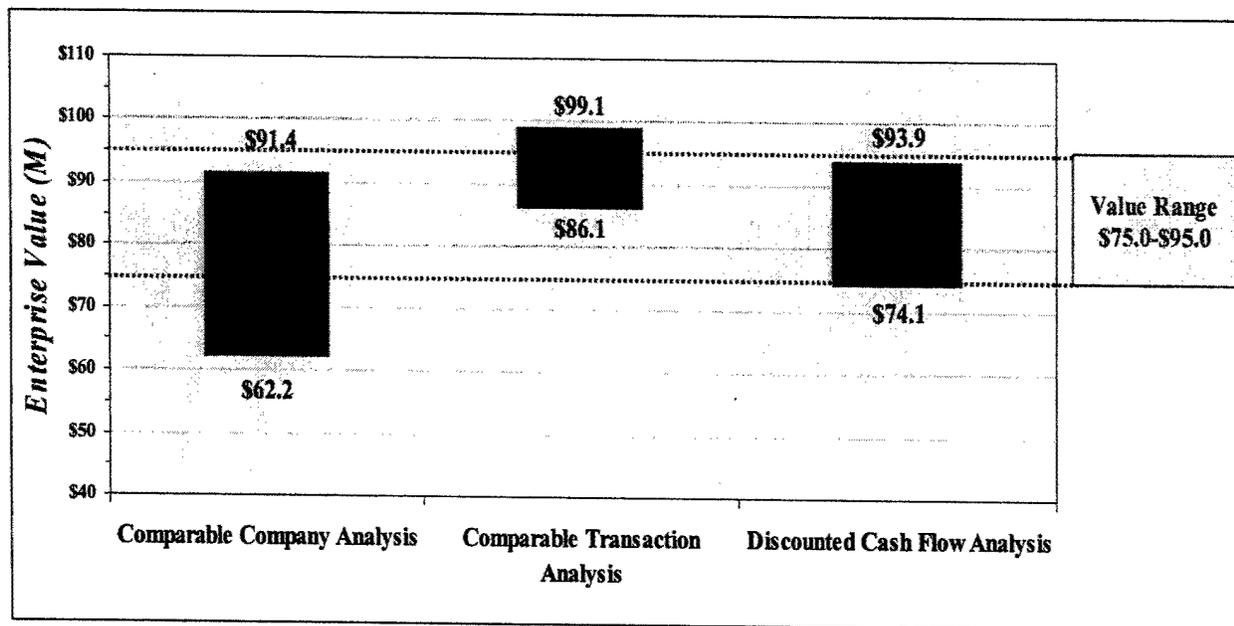


Figure I-3. Value Range

Since most government industrial facilities have not operated in a free competitive market nor been subject to commercial management pressures, it is likely that a period of transition will be required before the enterprise achieves market-level efficiency and performance standards. Government industrial facilities may require significant recapitalization and investment in environment compliance and cleanup, and staff will most likely need to be retrained.¹⁹ It is PwC's view that a DCF valuation is the primary approach that can satisfactorily account for these issues while the Comparable Company Analysis and Comparable Transaction Analysis play a supporting role in the valuation.

¹⁸ CREDS page 322

¹⁹ PwC Consulting's Parcelization Business Case Analysis, December 2001

I.6 Results

The results should include a comparison of each approach. Usually more emphasis is placed on the value calculated using the Income Approach for income-producing property and the Market Approach for non-income-producing property, but the analyst should review the results and determine the most reliable and reasonable value for the property, and use a value range method (as depicted in Figure I-3 of this report).

a. Total Valuation

The analyst should then derive the total valuation for the assets; sum the lower and upper values for the ranges to determine a market value price range. The estimated fair market values developed by the Army and the potential buyers will be used to develop each side's negotiation position. The buyers will possibly use the estimates to approach lenders for loans or obtain internal corporate financing from their financing committees (or equivalent). The sale or disposition of assets will be conducted within government regulations and will probably rely heavily on analyses and accepted practices used by Wall Street (investment banks).

b. Preparing for the Transaction (Implementation Plan)

The analysis should develop the scenarios and provide the sales value ranges, but Army leadership must decide whether to proceed with the sale. If so, the Army will need to develop and implement a plan to conduct the sale. An implementation plan is a topic for a different report and will not be discussed here (refer to Figure I-1 for the basic implementation plan steps).

APPENDIX J FEDERAL GOVERNMENT CORPORATIONS (FGCs)

The Center for Army Analysis (CAA), with assistance from PricewaterhouseCoopers (PwC), prepared the following appendix that reviews federal government corporations (FGCs).

J.1 Overview

An FGC is a possible alternative for the management of the Army's industrial operations and should be considered during upcoming stationing analyses and the 2005 Base Realignment and Closure (BRAC) round. The information in this appendix will assist the Army, now and in the future, when examining possible FGC structures.

The FGC analysis was conducted in three phases (Background Review, Case Studies, and Analysis) and includes two case studies: United States Enrichment Corporation (USEC) and the Corporation for National and Community Service (NCSA).

A Federal Government Corporation is a separate legal entity chartered directly by an act of Congress or by persons acting pursuant to congressional authorization.¹ The Office of Management and Budget guidance for the establishment of FGCs is limited.²

a. Background

- The U.S. Government currently operates more than 40 FGCs, of which only one provides products strictly for government use.³
- FGCs have been within the government for more than 200 years. One of the first FGCs was the Second National Bank.⁴
- The OMB discourages the use of FGCs, because of the lack of the FGC's accountability to the U.S. government. As a result, prior to initiating an FGC, the Army will have to develop a preliminary business case outlining the recommended approach for the establishment of an FGC, seek approval, and submit a request to OMB for review and comment.
- The Defense Working Capital Fund (DWCF) Reform Task Force recommends that the Department of Defense conduct a detailed feasibility analysis on the viability of adopting the FGC structure. The DWCF Task Force does not indicate which service or organization should be used as the pilot project. (Note: Ground System Industrial Enterprise (GSIE) may apply to become the pilot program that the Task Force recommends.)⁵
- FGCs require enabling legislation that clearly defines the authorities and outlines the responsibilities of the FGC.

¹ Froomkin, A. Michael, "Reinventing the Government Corporation." *Illinois Law Review*. 1995 U. Ill. L. Rev. 543. Available at <http://law.miami.edu/~froomkin/articles/reinvent.htm>

² David Childs Office of Management and Budget, interviewed by PriceWaterhouseCooper personnel.

³ Froomkin, "Reinventing the Government Corporation."

⁴ Ibid.

⁵ Defense Working Capital Fund Reform Task Force, Environmental Support Group Briefing, August 20, 1998. Available at <http://www.defenselink.mil/dodreform/dwcf/dwcfreport.ppt>

- To be a self-sustaining enterprise, the FGC would need a service-level agreement and a market. The service-level agreement provides a means to obtain low-cost financing, and the defined stable market allows management to develop long-term strategic plans.
- FGCs can take several years to implement. The United States Enrichment Corporation case study demonstrates that it took more than 10 years to get its charter approved.

b. Definitions

Federal Government Corporation (FGC) – is a separate legal entity chartered directly by an act of Congress or by persons acting pursuant to Congressional authorization. FGCs are established when the mission, often viewed as a necessity to fill a gap in the private sector, is basically commercial, is potentially self-sustaining, and involves a large number of business-type transactions with the public. FGCs are most commonly created to operate a self-sustaining bank, issue insurance, or conduct other commercial activity. An FGC is created to be more efficient than a traditional government department, as an efficient form of nationalization, and as a preparation for eventual privatization.

Mixed Ownership Government Corporation (MOGC) – usually has less than 100 percent of the stock owned by the government, and some board members are elected by the other stockholders (e.g., Government Corporation).

Wholly Owned Government Corporation (WOGC) – 100 percent of the stock is owned by the government, and the entire board of directors is appointed by the government (e.g., Government-Sponsored Enterprise).

Private Corporation (PC) – the Federal Government holds no stock, but can have a statutory right to select board members.

Government-Sponsored Enterprise (GSE) – is a privately held corporation with public purposes created by the U.S. Congress to reduce the cost of capital for certain borrowing sectors of the economy such as students, farmers, and homeowners. A GSE carries the implicit backing of the U.S. Government, but they are not direct obligations of the U.S. Government.

c. Actions for FGC Development

The following section addresses the possibility of a FGC for the Army Industrial Base. Actions required include:

- **Determine Army and other DOD requirements:** Evaluate the munitions requirements process and adopt supply chain best practices. Prior to evaluating the disposal of assets, it would be prudent to validate the requirements processes. Once the requirements processes are redesigned (if required), the Army should adopt supply chain best practices in use by the Defense Logistics Agency (DLA) and other manufacturing operations. In doing so, the plants can right size and gear capital expenditures to where they are the most useful.

- Develop a comprehensive strategy that addresses DOD industrial base requirements and capabilities. The overall industrial base strategy needs to include the ammunition facility strategy.
- Develop an implementable business case analysis (in accordance with OMB rules and cost/benefit guidelines) that includes a market analysis, a financial plan, a manufacturing and operations plan, and risk and viability assessments. OSC staff will present it to senior Army and DOD staff, and then the case would be sent to OMB for their comments and suggestions.
- Evaluate other options for the industrial base type of installations and compare to the FGC:
 - Public-Public Partnerships
 - Public-Private Partnerships (ARMS)
 - Sale of facilities
 - Retention of government agency status
- Evaluate the potential for establishing an FGC by:
 - Presenting the draft implementation plan to OMB for comment and approval.
 - Seeking advocates in the executive and legislative branches – once the business case is developed, the proponents of the plan need to develop a road show for congressional members and their staffs. Sponsorship should be sought (at a minimum) from the Armed Services and Appropriations Committee members.
 - Conducting a pilot program – select a facility that is already using progressive strategies. This would minimize the turmoil for the staff and improve the program's likelihood of success.
- Advertise successes. The AMC needs to inform the appropriate legislative committees of its successes and build upon any authorized pilot programs. This can be done at seminars, with white papers, and in trade and government journals.

J.2. Background

a. **Spectrum of Service Delivery Options.** FGCs are a method of providing a service among a long list of various service delivery options. As seen below, the FGC continues to operate under government control. The following are explanations of the various service delivery options:

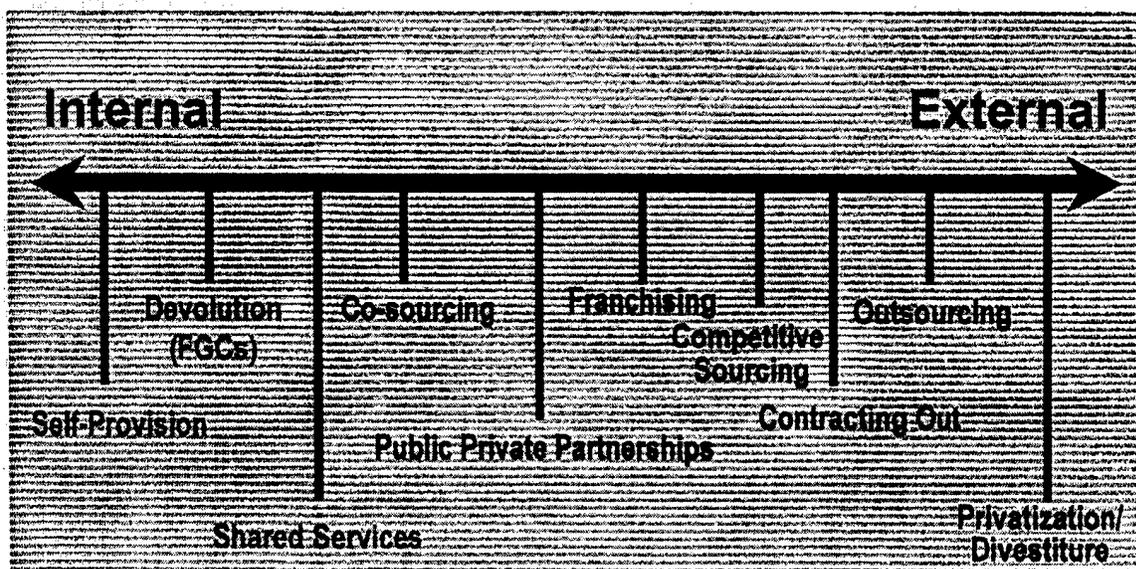


Figure J-1. Service Delivery Options

- **Self-Provision** – the provision of services through internal facilities managed by full-time or part-time staff.
- **Devolution** – the provision of services through the transference of responsibilities, obligations, and powers to another authority (can be seen as undercutting “economies of scale”).
- **Shared Services** – the provision of services within an organization whereby service requirements of many operating units are consolidated in order to create internal scale and leverage existing internal capacity.
- **Co-sourcing** – the provision of services through a joint venture arrangement whereby risks and benefits are shared among participants in order to create new scale and synergy advantages, rather than a supplier/beneficiary arrangement, so that a vendor is not always involved.
- **Public Private Partnerships** – the provision by the private sector to the public sector of services, along with the associated use of new or improved assets, characterized by long-term contracts with risks allocated to the party best able to accept, manage, and mitigate each [e.g., Government-Owned, Contractor-Operated facilities and Federally Funded Research and Development Centers (FFRDCs)].
- **Franchising** – the provision of services through granting a license to the selected supplier to provide agreed-upon services within a specified jurisdiction.
- **Competitive Sourcing** – subjecting a governmental function to competition between public sector and commercial providers and choosing the best value for the taxpayer.
- **Contracting Out** – the provision of services on the basis of a one-time contract to a supplier, typically of shorter length than in outsourcing, with fewer services included, management of the services retained by the beneficiary, less flexibility to change the nature of the services during the contract term, and limited termination assistance.
- **Outsourcing** – the provision of services through a long-term agreement with specific scope and a close relationship that typically translates existing vendor synergy and

economies of scale into savings for the beneficiary. Services are typically available in a competitive environment.

- **Privatization/Divestiture** – in public-sector situations in which it is desired that the services continue to be provided: the provision of services through transferring responsibility for service provision from the public to the private sector. In private-sector situations in which continuation of the service is not a requirement: withdrawal from the provision of a service and disposal of the assets and resources used in providing the service.

a. Corporate Structure – Risk and Control

- Figure J-2 depicts the relative levels of private-sector risk and involvement versus the amount of government control for four different types of entities:⁶

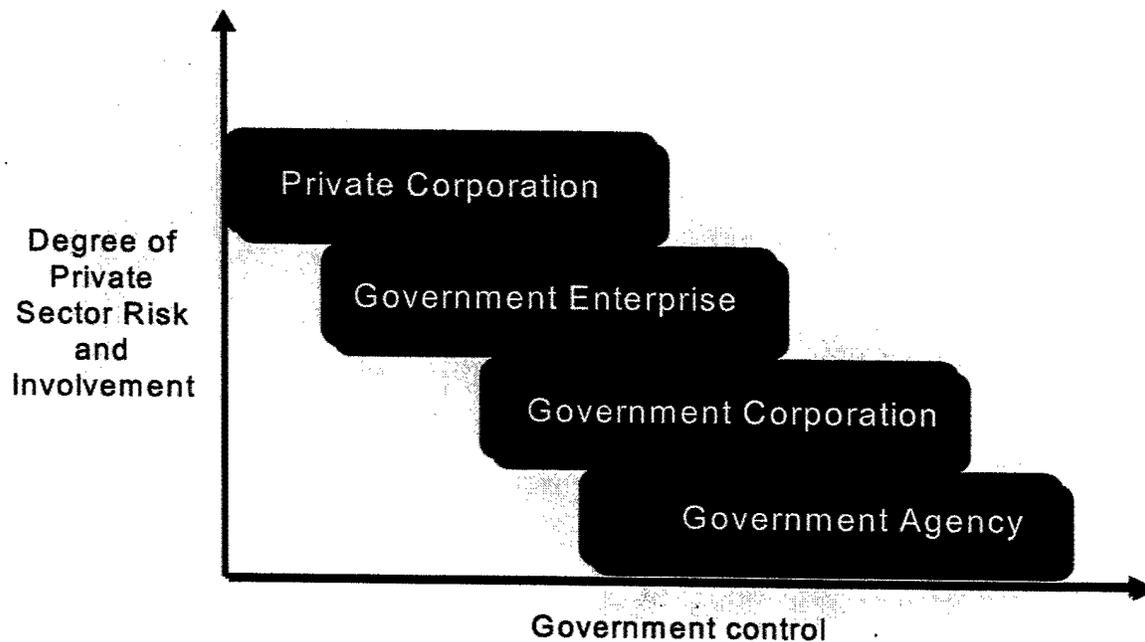


Figure J-2. Risk and Government Control

- A **private corporation** has limited government control (privately owned) and high levels of private risk and involvement. Government control is restricted to policing and oversight activities (by SEC, IRS, Treasury, OSHA, etc.) and possible participation as a client. The risk resides with the stockholders.
- **Government-sponsored enterprises** are chartered by Congress (mixed ownership) and provide services to the public at large. Government may provide some financing and may have the right to appoint board members and conduct oversight, but technically these firms are not backed by the full faith and credit of the Federal Government, so they are financed “off budget.” The potential risk is not included in the debt ceiling or debt

⁶ U.S. General Accounting Office. Report to the Ranking Minority Member, Subcommittee on Post Office and Civil Service, Committee on Governmental Affairs, U.S. Senate: Government Operations, Profiles of Existing Government Corporations. GAO/GGD-96-14. Available at <http://www.gao.gov/>

projections unlike other loan or subsidy programs. In effect, government has some risk with limited control over entities like Fannie Mae and Freddie Mac.

- **Government corporations** provide greater government control (wholly government owned) and less private risk and involvement than GSEs. The corporations are created by legislation that outlines the limitations and structure of these entities. They are usually exempt from most procurement and budget rules, but they are usually deemed to be part of a Cabinet department. Therefore, the government can exert some control over these firms.
- **Government agencies** provide the highest level of control and lowest level of private risk and involvement. The Executive Branch controls the agencies, and the Congress authorizes and appropriates funding. The private sector is not involved in operations (other than as contractors), so their risk and involvement in strategic planning and managements are extremely limited.

c. Comparison of Public and Private Entities

Figure J-3 is the FGC continuum, starting with the government department on one side and the private corporation on the other. As you move from left to right, the degree of government control and risk declines and the degree of corporate risk and control increases. As one moves from left to right, financing moves from 100 percent government financing to partial funding and partial self-funding to total private financing.⁷

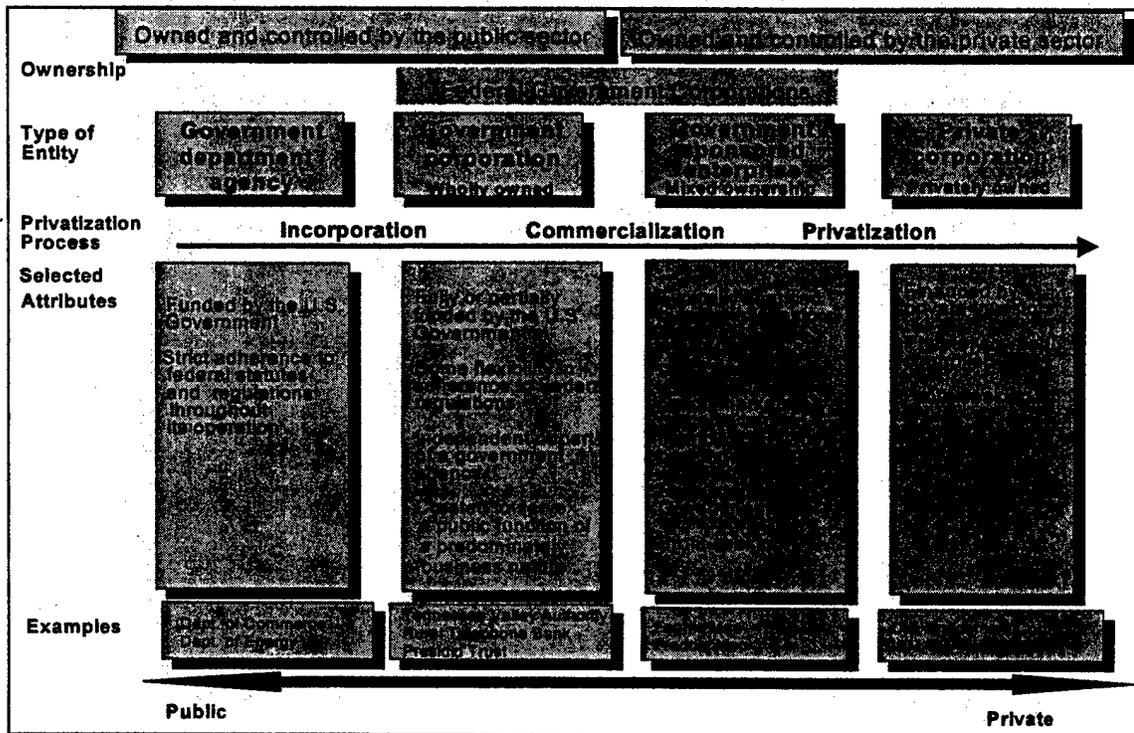


Figure J-3. FGC Continuum

⁷ Ibid. GAO/GGD-96-14

On the continuum, changes occur in:

- **Ownership** – As a government agency or corporation, the ownership resides in the public sector. Consequently, the employees and managers are accountable to the citizenry. On the other hand, shareholders own the GSEs and private corporations, and management is primarily accountable to them.
- **Investment** – Investment in public enterprises is derived from appropriations, fees, fines, and other sources of government revenues. The private entities can sell ownership shares and may even be able to borrow from the capital markets.
- **Motivation** – Because the public entities are accountable to the citizenry, motivation is primarily to provide services and meet the mission requirements of the agency (in order to secure future appropriations). Motivation in private entities is based on profitable operations, which result in increased share prices.
- **Control** – For the public entities, control is exerted by agency heads (regulatory and resource allocation) and legislators (through appropriations and legal restrictions), so oversight and control is significant. For private entities, the senior management and directors provide control. Thus government may have a limited say in matters related to services provided; however, the public has significant control over the organization.

d. Federal Government Corporations – Key Points

- A Federal Government Corporation is a separate legal entity chartered directly by act of Congress or by persons acting pursuant to congressional authorization.⁸
- FGCs are established when the mission, often viewed as a necessity to fill a gap in the private sector, is basically commercial, potentially self-sustaining, and involves a large number of business-type transactions with the public. The private sector is also unwilling to step in and perform the service. For example, FGCs are most commonly created to operate a self-sustaining bank, insurance, or other commercial activity. Ordinarily, the Federal Government is involved in the activity either because the goods or services are deemed of national importance but are not adequately provided by the private sector⁹ or because the commercial opportunity is a by-product of some other Federal activity.
- An FGC is created to be more efficient than a traditional government department/agency, is an efficient form of nationalization, and appears to be effective as a process for privatization.
- FGCs are not established to take business away from the private sector. They are established to provide a service that the private sector cannot or will not provide. (Note: GOCOs are operated by the private sector and thus they are considered privatized. Placing a service currently being provided by the private sector into an FGC does not appear to pass the FGC litmus test and should not be considered a candidate for an FGC.)

⁸ Froomkin, "Reinventing the Government Corporation."

⁹ Hynes, Michael, Sheila Nataraj Kirby, Jennifer Sloan, *A Casebook of Alternative Governance Structures and Organizational Forms*, RAND, Forces and Resources Policy Center of RAND's National Defense Research Institute, 2000.

- Distinctive features of a FGC:¹⁰
 - Operates as a self-sustaining, commercial organization
 - Provides goods and services not provided by the private sector
 - Customers are almost always the commercial sector or general public
- Pros:¹¹
 - Efficiency of execution of policy mandates from commercial structures; more flexibility and greater opportunity to operate outside the annual reporting cycle.
 - Insulation of programs from political forces
- Cons:¹²
 - “Off the balance sheet” financing
 - Lack of financial accountability
 - Potential conflicts with constitutional issues

Examples: Amtrak, U.S. Postal Service, Tennessee Valley Authority, Smithsonian Institution

e. FGC Litmus Test

President Truman’s 1948 budget message established requirements that he recommended should be used when creating an FGC. Although not enacted into legislation, his FGC recommendations became the “litmus test” used today for establishing an FGC. According to President Truman, an agency may be a good candidate for an FGC if:¹³

- The activity is predominantly of a business nature, and services or products will be provided for which a fee or other services are received.
- The activity can produce revenue and/or be potentially self-sustaining. In some cases, there is a significant market that would support the privatization of the activity. In that case, creating an FGC would be the first step toward privatization. The entity can then refine its mission, borrow funds in the credit markets, and establish the financials required to “go private.”
- The activity involves a large number of business-type transactions with the public (e.g., service-level agreements). Services to other agencies or departments may be provided using an alternative model (e.g., franchise).
- The activity requires greater flexibility than the customary type of appropriations budget ordinarily permits. For example, if the entity may have a business requirement need to borrow funds (from other than the U.S. Treasury) or carry over funds between fiscal years, an FGC structure may prove to be appropriate.

If the government agency does not fit the profile, another model should be selected.

¹⁰ Held, Bruce, Kenneth P. Horn, Christopher Hanks, Michael Hynes, Paul Steinberg, Chris Pernin, Jamison Jo Medby, Jeff Brown, *Seeking Nontraditional Approaches to Collaborating and Partnering with Industry*, Arroyo Center, 2002. Available at <http://www.rand.org/publications/MR/MR1401/>

¹¹ Peter J. Wallison, *Serving Two Masters, Yet Out of Control: Fannie Mae and Freddie Mac*. (Washington, D.C.: AEI Press, 2001).

¹² Ibid.

¹³ Froomkin, “Reinventing the Government Corporation”

f. Truman's Litmus Test Requirements – Expanded

As stated earlier, FGCs have been established throughout the history of the U.S., mostly to serve a specific group or geographical area or promote a social policy. (Note: The Second U.S. Bank was created by John Hamilton and was said to favor big business.) After conducting extensive research on government-sponsored enterprises and FGCs, Michael Froomkin and others identified four reasons for creating FGCs:¹⁴

- **Efficiency** – better at achieving a national goal involving market transactions. Mr. Froomkin could find little empirical evidence that FGCs were any more efficient than public entities in providing services to the public. One reason may be that the government lacked the financial structures and performance measures to validate the efficiency gains.
- **Political Insulation** – from the Cabinet department that would have jurisdiction or from future administrations. By creating a corporation that is not solely dependent on appropriations and that requires additional legislation to change or dissolve, the designers can, in effect, ensure that the service provision will go uninterrupted regardless of the administration.
- **Subsidy** – create and pass a subsidy to constituencies (e.g., GSEs such as Fannie Mae and Freddie Mac). While the U.S. Government does not legally back the subsidies, the entities are treated as if there is an implicit guarantee. Consequently, these organizations are able to borrow funds at a lower rate and pass savings on to customers.
- **Subterfuge** – providing off-budget financing. This is also related to reason three, immediately above. The subsidies can be taken off budget and are therefore not included in government financial statements or calculations of the national debt. This became a significant issue in the mid 1980s and early 1990s with the savings and loan scandals where the Federal Savings Loan Insurance Corporation (FSLIC) that was insuring insolvent savings and loans became insolvent itself. To resolve FSLIC's insolvency, the government created another FGC to bail it out.

g. FGC Attributes

The legislation that establishes an FGC sets the limits on its operations and determines its organizational structure. In general, FGCs have the following attributes:

- FGCs can sue and be sued and settle cases without Department of Justice (DOJ) authorization. For instance, they are not required to seek DOJ approval and assistance to settle suits or collect large debts.
- FGCs can contract for services and equipment:
 - Can enter into multiyear commitments, and long-term contracts are not counted against the government budget,

¹⁴ Ibid.

- Can avoid Federal Acquisition Regulation (FAR) requirements¹⁵ such as competition and Cost Accounting Standards (CAS) compliance if they are not providing services to the government. However, if they are providing services to the government, all government regulations and laws apply.
- Can avoid property disposal laws and regulations such as the Federal Property and Administrative Services Act of 1949.
- FGCs can hold property and own land and capital assets indefinitely.
- FGCs can borrow funds (other than from the U.S. Treasury). The FGCs can go to the capital markets to borrow funds.
- FGCs have budgetary freedom. The FGCs are usually not subject to the same budget rules as agencies and departments. For example, they are not required to obligate funds prior to the end of the government's fiscal year and can roll over the funds into the following year:
 - They can carry over unexpended funds.
 - Long-term-planning is enhanced (e.g., capital purchases and leases are not subject to OMB's prohibitive scoring rules).
 - They can employ nongovernmental employees and are able to better provide incentives for performance and quickly address changing staff requirements.

J.3 Case Studies

The following case studies were chosen from more than 40 Federal Government Corporations. The first case, United States Enrichment Corporation (USEC), covers the process of taking an agency and converting it into the private sector. The second case, Corporation for National and Community Service (CNCS), covers the process of establishing an FGC to provide a service that the private sector did not provide.

a. United States Enrichment Corporation – A Privatization Model

The U.S. Enrichment Corporation, a private firm established in July 1998, is a global energy company, currently controlling 75 percent of the North American uranium enrichment market and a 40 percent share of the world market. The USEC began as an agency in the Department of Energy and was privatized in 1998. It moved through three stages of privatization: Incorporation, Commercialization, and Privatization.

To incorporate the agency, Congress passed and the President signed the Energy Policy Act in 1992. After four years, the U.S. Privatization Act was passed, providing for the privatization of the corporation. The USEC explored two paths to privatization [merger and acquisition and initial public offering (IPO)]. The directors ultimately chose an IPO, which was completed in 1998. This privatized the firm, which competes in a global public market for enriched uranium.¹⁶

¹⁵ Ibid.

¹⁶ U.S. General Accounting Office. Report to the Ranking Minority Member, Subcommittee on Post Office and Civil Service, Committee on Governmental Affairs, U.S. Senate: Government Operations, Profiles of Existing Government Corporations. GAO/GGD-96-14. Available at <http://www.gao.gov/>

1. USEC Privatization Process in Detail

The initial legislation to privatize the Uranium Enrichment Enterprise (UEE) was passed by the Senate in both March and August 1988; however, the bills did not pass in the House of Representatives until 1992. It took about 5 years to pass the UEE's charter.

Passage of the Energy Policy Act of 1992 established the USEC. Under this act (EPACT - P.L. 102-486), USEC replaced the UEE and became a wholly owned government corporation and the exclusive marketing agent of enriched uranium for the government. It continued to function as a government corporation from 1992 until 1996.

Legislative proposals to privatize the USEC were introduced in the House and Senate in 1995. The amended bills were included in the budget reconciliation bill, that was cleared by the House and the Senate on November 17, but vetoed by the President on December 6. A substitute bill was introduced on January 26, 1996, and included in the Balanced Budget Down Payment Act II. The conference report was passed by the House and Senate on April 25, 1996, and signed by President Clinton on April 26, 1996.

Provisions in the law clarify the liabilities of the U.S. and the corporation. The purpose was to keep the buyer of USEC free of government-created liabilities and make a "clean break" from the government corporation. A provision in the law requires the DOE to treat, store, and dispose of low-level radioactive waste produced by the corporation at DOE facilities.

The President approved the privatization plan in July of 1997. The USEC studied privatization via two paths: IPO or merger and acquisition. The final choice was to pursue an IPO, which was completed on July 28, 1998. Since USEC's IPO, its financial position has deteriorated, and its management team chose to close one of its enrichment facilities that it originally agreed to keep open.¹⁷

2. United States Enrichment Corporation Specifics

While still operating as the Uranium Enrichment Enterprise, the precursor to USEC, the organization had an estimated operating loss of \$10B. In addition, researchers have estimated that the government subsidies for USEC's 1994 automatic vapor laser isotope separation (AVLIS) plan were \$2B. The management of the firm cancelled the AVLIS program after the firm became a private entity.

The General Accounting Office (GAO) predicted that the USEC privatization would recover \$1.7B to \$2.0B, but that taxpayers would still lose between \$0.6B and 2.2B. The GAO's estimate was proven correct; the original offering grossed \$1.9B. Thus, the amount recovered by the IPO was insufficient to cover its \$2.3B-\$4.2B costs.

As a condition for the privatization, USEC shed all of its environmental liabilities, which were retained by DOE.

¹⁷ Marc Humphries, Congressional Research Service Brief 95111: *Privatizing the United States Enrichment Corporation*. Updated December 4, 1996. Available at <http://www.fas.org/spp/starwars/crs/95-111.htm>

Since the completion of the initial public offering, USEC's financial position has deteriorated, as witnessed by the following:¹⁸

- Its stock price fell from \$14 to \$2.95 in 2000. It has recovered somewhat and is currently trading at about \$8.25.
- Its bond rating was downgraded to "junk" status during summer 2000. The firm's 2001 financial report does not indicate that the rating has been or will be upgraded.

In addition to canceling the AVLIS program, the firm closed one of the enrichment facilities, which under its original charter, was to remain open until at least 2005.

The USEC privatization highlights the potential conflicts between acting as a public agent and a private firm.

3. USEC Challenges

The USEC's financial condition has deteriorated since its initial public offering. It has suspended development of AVLIS technology, and closed one of two uranium enrichment plants. As a result, there is a belief that the USEC has not met the goals for which it was privatized, given exclusive rights to technology, and relieved of financial responsibility for past operations (retirement benefits, environmental liabilities, and lawsuits). Numerous reasons have been put forth for the apparent decline since USEC's privatization:¹⁹

- Requirement for privatization forced USEC's fiduciary responsibility into conflict with its role as a federal agent. Once the entity privatized, it was no longer responsible to the DOE; its primary responsibility was transferred to the stockholders, and public policy concerns became secondary.
- Restrictions placed on the firm hampered growth and planning options. Requirements in the legislation privatizing the USEC limited management's options. For example, the legislation contained the following provisions:
 - A prohibition against laying off more than 500 employees during its first two years of operation,
 - A requirement to keep two plants open through 2005 (management was able to invoke an escape clause to close one plant).
 - Dumping of enriched uranium on the market by subsidized, foreign firms hurt its market price.

¹⁸ Ibid.

¹⁹ Ibid. (Miscellaneous PwC analyses see bibliography).

b. Corporation for National and Community Service

The NCSA is a government corporation created in 1993 to manage three previously established programs: AmeriCorps, Senior Corps, and Learn and Serve America.²⁰

AmeriCorps – many of its programs hire employees who support organizations like:

- Habitat for Humanity
- American Red Cross
- Boys and Girls Clubs

Senior Corps – taps the skills and talents of Americans 55 years old and over for the following programs:

- RSVP (Retired and Senior Volunteer Program)
- Foster Grandparents
- Senior Companions

Learn and Serve America – provides grants to schools and colleges and links classroom studies with community service.

The NCSA's origins lie in the Domestic Volunteer Service Act of 1973 and National Community Service Act of 1990.

- **NCSA History.** The National and Community Services Trust Act of 1993 established the Corporation for National and Community Service in 1993. The FGC manages and expanded the operations of VISTA and the Senior Corps and continues the work of the Points of Light Foundation. It is a government corporation that provides services to communities without requiring in-kind services or payments.²¹

The NCSA does receive appropriations and requires reauthorizing legislation (unlike most other FGCs). There are no plans for the organization to privatize or be self-sustaining.

- The NCSA expanded its services provided by ACTION-VISTA and Senior Corps program, which began during the early 1970s.
- More than 2 million Americans serve their fellow citizens each year through the corporation's three main programs: AmeriCorps, Senior Corps, and Learn and Serve America:
 - Senior Corps – Through its three programs, the Senior Corps taps the skills, talents, and experience of more than half a million Americans aged 55 and over to meet a wide range of community challenges, including homeland security.
 - AmeriCorps – More than 50,000 Americans are serving their communities 20 to 40 hours a week through AmeriCorps. AmeriCorps also administers two programs that

²⁰ Corporation for National and Community Service's 2001 corporate financial statements and its website. Available at www.nationalservice.org

²¹ Ibid.

operate somewhat differently: (1) AmeriCorps*VISTA, which has approximately 6,000 members, focuses on eradicating poverty and helping to meet the needs of people living in low-income communities nationwide; (2) AmeriCorps*NCCC (National Civilian Community Corps) is a residential program for approximately 1,000 members aged 18 to 24. Based on a military model, the program sends members in teams of 10 to 14 to help nonprofit groups provide disaster relief, preserve the environment, build homes for low-income families, and meet other challenges.

- Learn and Serve America – Learn and Serve America provides grants to schools, colleges, and community organizations to link classroom studies with community service.
- The NCSA does not charge for its services; so there is no means of becoming a self-sustaining entity other than contributions, etc.
- The corporation received an unqualified opinion by the auditors for fiscal year (FY) 2001. This is a significant achievement for the corporation and took six years to obtain.

The FY 2001 Financial Report states the corporation has:

\$1,160M in assets

\$ 789M annual operating budget (\$754M of the operating budget is Congressionally appropriated.)²²

J.4 Analysis of the Organic Industrial Base

a. Ammunition and Arsenal Facilities

The next section ties the above attributes of an FGC to the industrial base. Figure J-4 lists facilities according to category (Active, Inactive, Excess) and type of operation (either GOGO or GOCO).²³

²² Ibid.

²³ Operations Support Command, *Industrial Operations Command: Capability Summary* FY 2000.

<ul style="list-style-type: none"> • Active <ul style="list-style-type: none"> ➤ Crane Army Ammunition Plant (GOGO) ➤ Hawthorne Army Depot (GOCO) ➤ Holston Army Ammunition Plant (GOCO) ➤ Iowa Army Ammunition Plant (GOCO) ➤ Lake City Army Ammunition Plant (GOCO) ➤ Lone Star Army Ammunition Plant (GOCO) ➤ McAlester Army Ammunition Plant (GOGO) ➤ Milan Army Ammunition Plant (GOCO) ➤ Radford Army Ammunition Plant (GOCO) ➤ Sierra Army Ammunition Plant (GOGO)* ➤ Watervliet Arsenal (GOGO)* ➤ Rock Island Arsenal (GOGO)* ➤ Pine Bluff Arsenal (GOGO) ➤ Anniston Army Maintenance Depot (GOGO)* ➤ Red River Army Maintenance Depot (GOGO)* ➤ Lima Army Tank Plant (GOCO)* <p>*GSIE facilities</p>	<ul style="list-style-type: none"> • Inactive <ul style="list-style-type: none"> ➤ Kansas Army Ammunition Plant (GOCO) ➤ Louisiana Army Ammunition Plant (GOCO) ➤ Mississippi Army Ammunition Plant (GOCO) ➤ Riverbank Army Ammunition Plant (GOCO) ➤ Scranton Army Ammunition Plant (GOCO) • Excess <ul style="list-style-type: none"> ➤ Badger Army Ammunition Plant (disposing) ➤ Cornhusker Army Ammunition Plant (disposing) ➤ Indiana Army Ammunition Plant (disposing) ➤ Longhorn Army Ammunition Plant (disposing) ➤ Ravenna Army Ammunition Plant (disposing) ➤ Sunflower Army Ammunition Plant (disposing) ➤ Twin Cities Army Ammunition Plant (disposing) ➤ Volunteer Army Ammunition Plant (disposing) ➤ Joliet Army Ammunition Plant (disposing)
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Figure J-4. Industrial Facilities

The GOGO facilities should be the focus of any FGC feasibility study, because the GOCOs have already gone through a privatization process of sorts and should be the focus of process improvements and rightsizing.

Currently the Ground Systems Industrial Enterprise at OSC is evaluating the feasibility of creating an FGC to own and operate two arsenals (Rock Island and Watervliet) and some other facilities (Anniston, Lima, and possibly Sierra).

b. Predisposal Requirements Assessment Process. Prior to establishing an FGC or disposing of assets, the Army should determine its requirements. The steps involved are:

- Identify the Army's (and other Services') ammunition, industrial products, and overhaul maintenance requirements.
- Determine the munitions type and quantity for training, contingency and war reserves. The review should include a base requirement and the sensitivity analysis associated with the requirement.
- Once the requirements are finalized: perform an analysis to determine where the requirements should be filled (organic or inorganic).
 - Perform a facility capacity analysis (organic), to include a line of balance. Each of the facilities should be evaluated to determine the actual and surge capacity available.
 - Assess military value.

- Perform a configuration analysis (mathematical approach to future needs of the facility). Can the equipment be realigned to increase efficiency? What capital investments will be required to expand or maintain the level of capacity required?

c. Ammunition/Arsenal Privatization and FGC Decision Analysis Tree

The FGC Decision Analysis Tree below identifies options for the operation and ownership of the ammunition plants and arsenals. One can follow the decision points to reach a conclusion and then test the conclusion via the FGC litmus test.

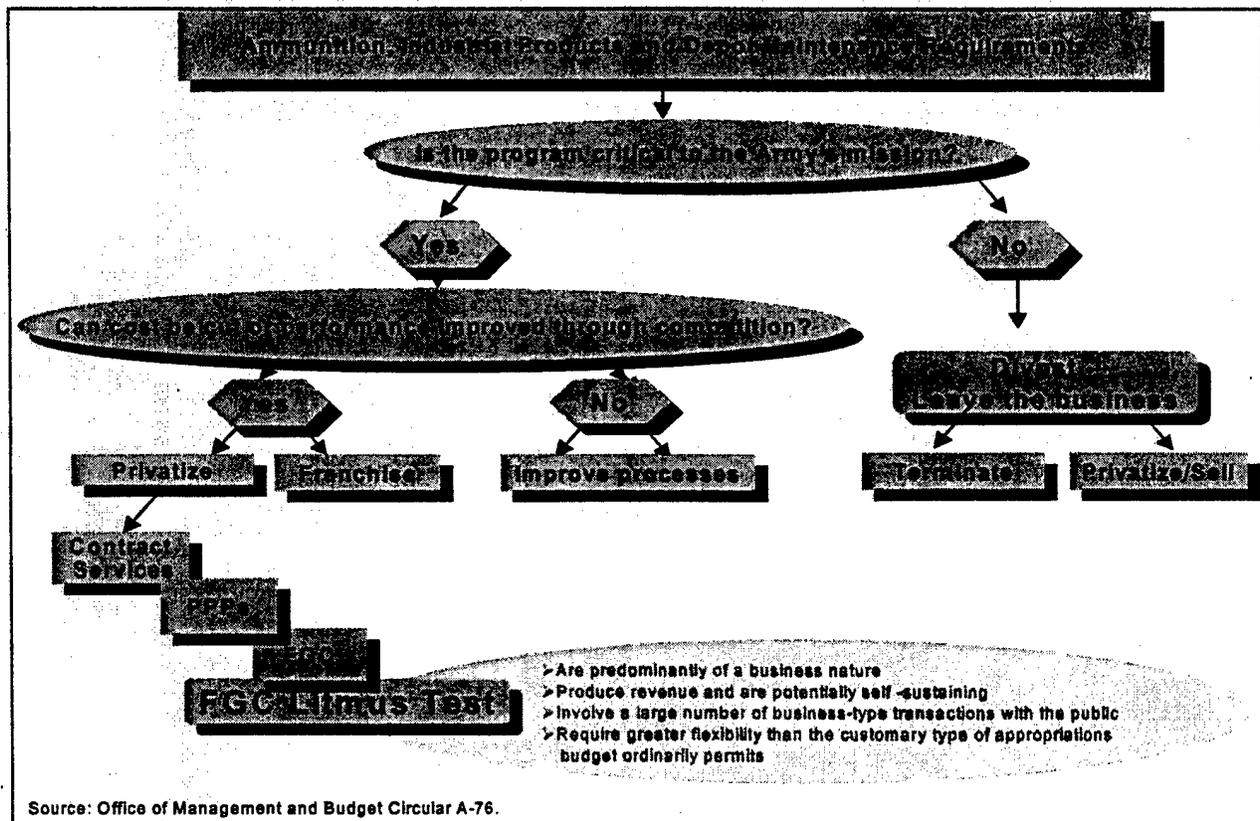


Figure J-5. FGC Decision Analysis Tree

The first question in Figure J-5 addresses the mission. Is operation of the ammunition plants critical to the Army mission? On this point, there are differing opinions. People may agree that the products are critical, while they may differ regarding the belief that the Army must be highly involved. If one believes that ammunition production is not a critical Army mission, then the government should either terminate the contracts (which would reduce the supply, an unacceptable choice) or privatize the efforts. Because many of the facilities are GOCOs, this has already occurred.

If the production is critical, follow the path on the left and move to the next question: Can costs be cut or performance improved through competition? If not (e.g., small market, lack of command and control), then you need to concentrate on improving the current processes and obtain efficiencies where available. If costs can be cut, you have two choices: privatize or

franchise. In choosing to privatize, you can contract for services (e.g., public private partnerships) or create an FGC.

To determine the optimal option, look at the litmus test before conducting an in-depth analysis. For the ammunition plants and arsenals the answer to the first question is affirmative, and the answer to the second question is: there may be a potential for self-sufficiency at some facilities. The final two questions result in negative replies. A private-sector market does not exist, and budget flexibility is not a necessity for operations (while it does provide some planning benefits).

Because there are negative replies, one should evaluate the option to contract for services and determine whether creative performance-based contracts will meet the Services' needs.

d. Organic Industrial Base FGC Review

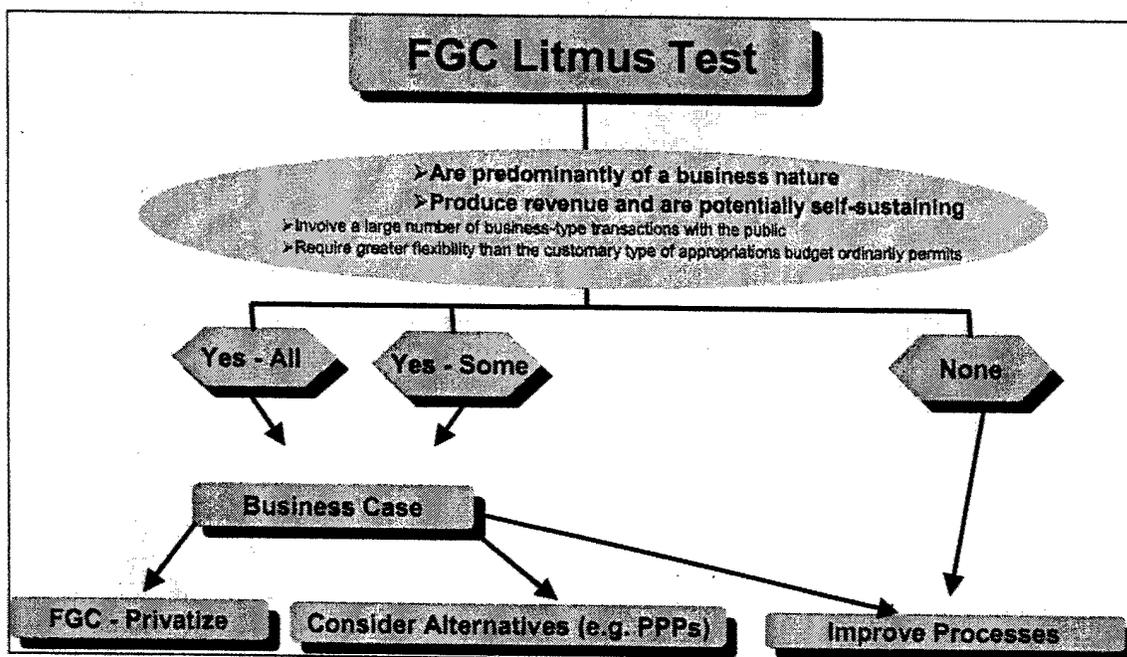


Figure J-6. Litmus Test

The litmus test for an FGC is not conclusive. Consequently, the Army should conduct a business case analysis to determine the best options. This would be required by OMB prior to proceeding with the establishment of an FGC, so conducting the analysis (while delaying the choice) is a mandatory step.

The business case should include a market analysis to determine the size of the world market, the number and strengths of competitors, and the potential buyers of the facilities or production contracts. Also, the case should be based on the costs to obtain valid requirements and should include all relevant factors (e.g., insurance, real estate taxes, etc.).

The results of the case should then be presented to the appropriate staff, who will determine whether to pursue the FGC option, contract for services, sell, or give away the assets.

e. Organic Industrial Base Business Case Analysis (BCA) Components and Assessment

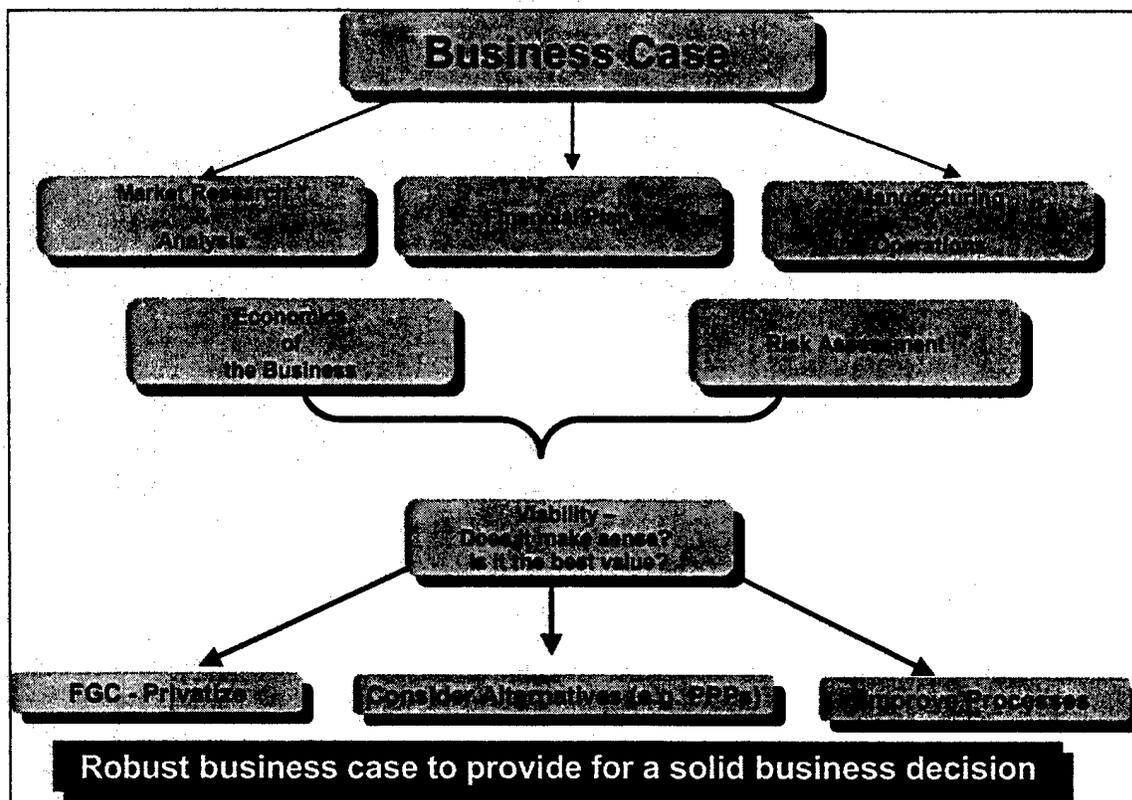


Figure J-7. Business Case

This graphic displays the following components of a business case:

- Market research and analysis – a study looks at the private market, the competitors, and future market demand.
- Economics of the business – each facility would be evaluated regarding the cost structure for each product line and the cost drivers identified. In addition, the industry benchmarks would be reviewed and compared with the current measures for the facilities.
- Financial plan – a plan to finance the operations and capital investments would be developed, and realistic financing options (Treasury borrowing, selling of shares) would be evaluated.
- Manufacturing and operations evaluation and plan – current operations and processes would be reviewed. New technologies would be identified to improve efficiency.
- Risk assessment – the risks would be identified, and the potential consequences evaluated.

Based on the components above, the alternative solutions are analyzed regarding their viability and then ranked according to best-value criteria (identified prior to the analysis). By evaluating

the outcomes against a set of agreed-upon criteria, the decision makers can make long-term policy decisions.

f. Assessment – GOGO Arsenals and AAPs

- GOGO arsenals and AAPs meet only two of the four “litmus test” requirements:
 - Are predominantly of a business nature
 - Produce revenue and are potentially self-sustaining
- GOGO arsenals and AAPs currently have the government as their principal customer (monopsony)
- GOGO arsenals, AAPs, and GSIE facilities need a robust business plan developed to determine the best option for the facilities.
- Privatizing (FGCing) GOGO arsenals and AAPs may be possible; however, other options may be more feasible and provide better value for the Army. Therefore, the Army should complete a business case analysis for the facilities in question and pursue the best-value option for the operation of the facilities.

J.5 Findings and Actions for FGC Development

a. Findings

- Many FGCs are currently operating in the U.S. Among these, we found only one, UNICOR, which provides products exclusively for the public sector. Most others provide services to the general public or to the private sector.
- FGCs have been in existence in some capacity for more than 200 years. The Second Bank of the United States was the subject of the first two cases to reach the Supreme Court regarding FGCs.
- There is little financial evidence that shows that FGCs are more efficient than government agencies. We could not identify any examples of proven efficiency increases for two reasons: First, no “as is” financial information was available at the time of the conversion from the government agency to the FGC. Second, no financial performance benchmarks were used to compare how efficient the agency was before and after the conversion.
- Accountability issues can arise after establishing an FGC. For example, FGCs are:
 - Not subject to state regulation.
 - Governmental. They often have special powers or access to cheaper capital, so they are largely immune from market forces and exempt from most constraints ordinarily applied to federal agencies.

Self-financing FGCs can even evade Congress’s power of the purse, and there are few, if any, visible limits on the powers that may be granted to private FGCs. No laws set out the duties of FGC directors appointed by the President; whether they have the same duties as FGC directors elected by shareholders is unclear. Thus, in practice, many FGCs remain free to operate as they wish, regardless of how they are classified. The enabling legislation sets the boundaries on the

FGC's operations. If accountability is not part of the legislation, the FGC may act in conflict with the intentions of the agency:²⁴

- Office of Management and Budget (OMB) guidance for the establishment of FGCs is limited. We could find no circulars or regulatory information regarding the procedures to follow. Through discussions with senior OMB staff, we learned that OMB, in general, does not promote the establishment of FGCs.
- Establishing FGCs at GOGO arsenals and ammunition plants may improve efficiency, but alternative models may provide similar results. For example, a long-term service agreement with strict performance standards may reduce the costs of products and provide the control and oversight necessary for the security of the plants and the supply of ammunition (this would likely require waivers or changes to current OMB guidance and FAR provisions).
- One needs to consider the requirements, capabilities, and capacity of the current facilities, along with the synergies and ability to reallocate resources between the facilities, prior to disposing of assets or establishing an FGC to operate them.

b. Actions for FGC Development

Whenever the Army considers an FGC, the Army should follow the steps described in paragraph J.4, Actions for FGC Development. These steps will help ensure a feasible working solution for a proposed FGC.

²⁴Froomkin, "Reinventing the Government Corporation" and PwC analysis.

APPENDIX K OSAF DATA UPDATE

K.1 Introduction. This appendix lists the source of data elements used in the OSAF model and describes where and how the data elements are used. Additionally, this appendix provides the current OSAF formulation, which was updated during the OSAF-ED analysis. Specifically, the following updates were made:

- (1) Report improvements
- (2) Included civilian pay area differentials
- (3) Included medical costs for both soldiers and their families.
- (4) Changed the managerial cost factors

K.2 Sources and Application of Data. Table K.1, below, is a listing of the data elements (metrics) used within the OSAF model. It describes for each metric, whether the metric is a data element or cost factor, the source and proponent, when the data was last updated, and any pertinent associated comments. Additionally, a reference number is listed at the beginning of each record that corresponds to the same reference included in Table K.2.

Table K.2 is a listing of each input data file compiled by the facility and unit database used by the OSAF model. First, the name of the input file is listed followed by a Data Source(s) which refers to the reference number in each record of Table K.1, (e.g., the file "costnew.txt" consists of metric data 67 through 87 referenced in Table K.1). Following the Data Source is a description of each input file.

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Table K.1. OSAF Model Data (Metric) Sources
(page 1 of 5 pages)

Ref	Metric	Data/F	Source	Proponent	Last Updated	Comment
<i>Personnel Data</i>						
1	Officer Married	Cost Factor	DEERS, 12/01	DCSPER	2002	
2	Enlisted Married	Cost Factor	DEERS, 12/01	DCSPER	2002	
3	Enlisted Housing MILCON	Cost Factor	BRAC 95	ACSIM	2002	
4	Officer Salary	Cost Factor	BRAC 95	DCSPER	2002	Inflated to FY02
5	Officer BOQ w/ Dependents	Cost Factor	DTIC Web Site	DCSPER	2002	Based on BRAC 95 data using O3 w/ Dependents as baseline
6	Enlisted Salary	Cost Factor	BRAC 95	DCSPER	2002	Inflated to FY02
7	Enlisted BOQ w/ Dependents	Cost Factor	DTIC Web Site	DCSPER	2002	Based on BRAC 95 data using E5 w/ Dependents as baseline
8	Average Unemployment Costs	Cost Factor	BRAC 95	DCSPER	2002	Inflated to FY02
9	Unemployment Eligibility	Cost Factor	ODCSPER	DCSPER	2002	
10	Civilian Salary	Cost Factor	ODCSPER	DCSPER	2002	Based on GS-9, Step 5
11	Civilian Turnover	Cost Factor	BRAC 95	DCSPER	2002	
12	Civilian Early Retirement	Cost Factor	BRAC 95	DCSPER	2002	
13	Civilian Regular Retirement	Cost Factor	BRAC 95	DCSPER	2002	
14	Civilians Not Willing to Move	Cost Factor	R&K Engineering	R&K Engineering	2002	Standard Factor from FY01
15	Civilian RIF Pay Factor	Cost Factor	BRAC 95	DCSPER	2002	
16	Civilian Retirement Pay Factor	Cost Factor	BRAC 95	DCSPER	2002	
17	Installation Per Cap Medical Costs	Cost Factor	MEDCOM	MEDCOM	2002	Result from MEDCOM Study
18	Priority Placement	Cost Factor	BRAC 95	DoD	2002	
19	PPS Involving PCS	Cost Factor	BRAC 95	DoD	2002	Inflated to FY02
20	Civilian PCS Cost	Cost Factor	BRAC 95	DCSPER	2002	Based on 2002 Housing Costs
21	National Median Home Price	Cost Factor	NAR Web Site	ACSIM	2002	
22	Home Sale Reimburse Rate	Cost Factor	BRAC 95	DCSPER	2002	Inflated to FY02
23	Max Home Sale Reimburse	Cost Factor	BRAC 95	DCSPER	2002	
24	Home Purchase Reimburse Rate	Cost Factor	BRAC 95	DCSPER	2002	Inflated to FY02
25	Max Home Purchase Reimburse Rate	Cost Factor	BRAC 95	DCSPER	2002	
26	Home Ownership Rate	Cost Factor	BRAC 95	ACSIM	2002	
27	HAP Home Value Rate	Cost Factor	BRAC 95	DoD	2002	
28	RSE Home Value Rate	Cost Factor	BRAC 95	DoD	2002	

**Table K.1. OSAF Model Data (Metric) Sources
(page 2 of 5 pages)**

Ref	Metric	Data (F)	Source	Proprietary	Last Updated	Comment
<i>Facilities Data</i>						
29	RPM Buildings Index	Cost Factor	CAA	TABS/IMD	2002	CAA Calculated Index
30	BOS Population Index	Cost Factor	CAA	TABS/IMD	2002	CAA Calculated Index
31	Exponent for BOS Function	Cost Factor	CAA	CAA	2002	4-Yr Avg Regression Analysis
32	Fixed SF for Community Facilities	Cost Factor	CAA	CAA	2002	Sum of Required Components
33	Medical Center Space Requirements	Cost Factor	CAA	MEDCOM R&K Engineering	2002	MEDCOM. Required Staffing R&K. Space Criteria (RPLANS)
34	Program Mgmt Factor	Cost Factor	BRAC 95	TABS	2002	
35	Caretaker Admin Space	Cost Factor	BRAC 95	ACSIM	2002	
36	Mothball Cost	Cost Factor	BRAC 95	ACSIM	2002	Inflated to FY02
37	OSAF Installations	Data	CAA	CAA	2002	OSAF Criteria
38	Installation BOS Costs	Data	CAA	ACSIM	2002	4-Yr Avg Analysis
39	Avg Bachelor Qtrs Size	Cost Factor	RPLANS	RPLANS	2002	ACTS Criteria
40	Avg Family Qtrs Size	Cost Factor	RPLANS	RPLANS	2002	ACTS Criteria
41	Rehab vs MILCON	Cost Factor	BRAC 95	ACSIM	2002	CAA Model
42	Info Mgmt Accounting Costs	Cost Factor	BRAC 95	DISC4	2002	CAA Model
43	Area Cost Factor	Cost Factor	HQUSACE	ACSIM	2002	
44	Site Percentage	Cost Factor	HQUSACE	ACSIM	2002	
45	Design Percentage	Cost Factor	HQUSACE	ACSIM	2002	
46	SIQH Percentage	Cost Factor	HQUSACE	ACSIM	2002	
47	Contingency Percentage	Cost Factor	HQUSACE	ACSIM	2002	
48	NPV/ROI Discount Rate	Cost Factor	OMB Cir A94	USACE	2002	Per OSAF, 7/01, K. 12.

Table K.1. OSAF Model Data (Metric) Sources
(page 3 of 5 pages)

Ref	Metric	Data/CF	Source	Proponent	Last Updated	Comment
<i>Transportation Data</i>						
49	Material/Assigned Person	Cost Factor	BRAC 95	TABS	2002	
50	Officer HHG Weight	Cost Factor	HQMTMC	DCSLOG	2002	Based on Avg. lbs./Household, FY99 and 00, O-3 Rank
51	Enlisted HHG Weight	Cost Factor	HQMTMC	DCSLOG	2002	Based on Avg. lbs./Household, FY99 and 00, E-5 Rank
52	Military HHG Weight	Cost Factor	HQMTMC	DCSLOG	2002	
53	Civilian HHG Weight	Cost Factor	HQMTMC	DCSLOG	2002	
54	Total HHG Packing Cost	Cost Factor	BRAC 95	TOPS	2002	Inflated to FY02
55	Shipping Costs per 100 lbs	Cost Factor	HQMTMC	TOPS	2002	
56	Military Light Vehicle Cost	Cost Factor	BRAC 95	CEAC	2002	
57	Heavy/Special Vehicle Cost	Cost Factor	BRAC 95	CEAC	2002	
58	TOE Unit Move Costs	Data	Forces Database	CEAC	2002	
59	POV Reimburse Cost	Cost Factor	DTIC Web Site	DCSLOG	2002	PCS Mileage Rates for FY02
60	Air Transport Cost	Cost Factor	DTIC Web Site	DCSLOG	2002	PCS Mileage Rates for FY02
61	Misc. Expenses	Cost Factor	BRAC 95	TABS	2002	Inflated to FY02
62	Miles Between Bases	Cost Factor	CAA	CAA	2002	
63	Per Diem Rates	Cost Factor				
64	Avg Military Tour Length	Cost Factor	BRAC 95	DCSPER	2002	
65	Routine PCS Costs	Cost Factor	BRAC 95	DCSPER	2002	Inflated to FY02
66	One-Time Officer PCS Costs	Cost Factor	BRAC 95	DCSPER	2002	Inflated to FY02
67	One-Time Enlisted PCS Costs	Cost Factor	BRAC 95	DCSPER	2002	Inflated to FY02

**Table K.1. OSAF Model Data (Metric) Sources
(page 4 of 5 pages)**

Ref	Metric	Data C1	Source	Proprietary	Last Updated	Comment
Construction Factors						
68	Administration Facilities	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
69	AFH	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
70	Aircraft Fuel Storage Facs	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
71	Aircraft Pavement	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
72	Ammo Storage Facilities	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
73	Aviation Maint Facilities	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
74	BT Barracks	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
75	Community Facilities	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
76	Dining Facilities	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
77	ELUPH	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
78	Medical Facilities	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
79	Operations Facilities	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
80	OUPH	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
81	Parking (Non-Organizational)	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
82	Parking (Organizational)	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
83	Storage Facilities	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
84	Training/Inst Facs (Active)	Cost Factor	CEAC, RPLANS	CEAC R&K Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC

**Table K.1. OSAF Model Data (Metric) Sources
(page 5 of 5 pages)**

Ref	Metric	Data/F	Source	Proprietary	Last Updated	Comment
85	Training/Inst Facs (ARNG)	Cost Factor	CEAC, RPLANS	R&K Engineering CEAC Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
86	Training/Inst Facs (USAR)	Cost Factor	CEAC, RPLANS	R&K Engineering CEAC Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
87	Vehicle Fuel Storage Facs	Cost Factor	CEAC, RPLANS	R&K Engineering CEAC Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
88	Vehicle/DOL Maint Facilities	Cost Factor	CEAC, RPLANS	R&K Engineering CEAC Engineering	2002	Facility Data from RPLANS, Cost Data from CEAC
Assets & Requirements Data						
89	Current Construction Projects	Data	R&K Engineering	R&K Engineering	2002	
90	Green and Red Facility Assets	Data	ISR (RPLANS) RPLANS, TAA09	VISTA R&K Engineering CAA	2002	Composed of TAA09 AC Force Structure, FY07 RC (Not Used) and TDA data
91	Major Unit. UIC Crosswalk (FY09)	Data				

Table K.2. OSAF Model Data (Metric) Applications
 (* Minor query of existing file. Flowchart not included.)
 (page 1 of 2 pages)

Ref	File Name	(See Table K.1)	File Description
1	cap_train_days.txt	89, 90	Training Range Assets
2	cap_train_km2.txt	89, 90	Maneuver Land Assets
*	civsal.txt	10	Civilian Pay by Installation
3	costfactors.txt	1, 2, 31, 32, 33, 34, 35, 36, 42, 44, 45, 46, 47, 48	Misc Cost Factors
4	costnew.txt	68-88	Unit Costs by Installation
4	costsustain.txt	68-88	Unit Costs by Installation
5	facreq.txt	91	OSAF Facility Category Requirements by Unit
6	G_Avail.txt	90	OSAF Facility Category Available ISR Green-Rated Space by Installation
7	Housingcost.txt	1, 2, 10, 17, 37, 38, 91	Cost to Provide Housing Facilities
8	Hsg_pok.txt	1, 2, 91	Current Military Population Housed by Installation
*	larea_rqt.txt	91	Impact Area Requirement by Installation
9	installations.txt	37	OSAF Installations by COMMAND_CODE
10	instbldgs_g.txt	90	OSAF Facility Category Existing ISR Green-Rated Space by Installation
10	instbldgs_o.txt	90	OSAF Facility Category Existing ISR Red- and Amber-Rated Space by Installation
11	instchar.txt	10, 17, 38, 37, 91	Misc Cost Factors and Data
12	instname.txt	37	OSAF Installations by COMMAND_CODE and Description
13	is.txt	37	Unit Initial Stationing Assignments
14	med_ret_sf.txt	MEDCOM Tasker	Medical Center Requirements for tblUNIT_RQTS (Access)
15	movecivcost.txt	8, 9, 10, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 43, 49, 53, 54, 59, 60, 62, 63	Cost to Move Units between OSAF Installations (by Unit)
16	movemilfamcost.txt	50, 51, 52, 55, 59, 62, 63, 64, 90	Cost to Move Families between OSAF Installations (by Unit)
17	movemiltdacost.txt	49, 54, 55	Cost to Move TDA Units between OSAF Installations (by Unit)
18	movemiltoecost.txt	58	Cost to Move TOE Units between OSAF Installations (by Unit)
*	name.txt	37	OSAF Installation Name Descriptions

Table K.2. OSAF Model Data (Metric) Applications
 (* Minor query of existing file. Flowchart not included.)
 (page 2 of 2 pages)

Ref	File Name	(See Table K.1)	File Description
6	O_Avail.txt	90	OSAF Facility Category Available ISR Red- and Amber-Rated Space by Installation
19	req_train_days.txt	91	Unit Training Range Requirement (in Days)
20	req_train_km2.txt	91	Unit Maneuver Land Requirement (in km ²)
21	UA/CA.txt	91	Unit/Stationing Definitions/Restrictions
*	ufac.txt	37	Unique Facilities Listing (by Installation, in Dollars)
22	unitchar.txt	91	Population Loading (by Unit)
*	unittype.txt	91	Type of Units (TOE, TDE, etc.)
23	units.txt	37, 91	Listing of OSAF Unit Ids
24	upcost.txt	68-88	OSAF Category Upgrade Costs (by Installation)
25	housing_cost.txt		

K.3 Formulation (as of 1 Jan 2003, subject to change)**Indices:**

<i>c</i>	facility condition
<i>f</i>	facility category
<i>i</i>	installation
<i>k</i>	maneuver land measured in km ² days
<i>r</i>	range type measured in days
<i>t</i>	installation type
<i>u</i>	unit
<i>y</i>	unit types

Sets:

CA_u	set of installations where unit <i>u</i> can be assigned
IS_i	initial stationing of units at installation <i>i</i>
N	set of ranges <i>r</i> requiring construction to satisfy any shortage
S	set of installations that share training assets
UA_i	set of units that can be assigned to installation <i>i</i>
FLX	set of installations that are "fixed" open
UT_y	set of units of type <i>y</i>

Data: (all \$ are fiscal year 2001 thousands of dollars and all SF are thousands of square feet)

K.2 Cost Data (units)

$Fcost_i$	fixed cost of keeping installation <i>i</i> open (\$)
$ManCostC_i$	program management cost to close installation <i>i</i> (\$)
$ManCostM_u$	program management cost to move unit <i>u</i> (\$)
$maxMILCON$	maximum one time cost for military construction (\$)
$maxMOVE$	maximum one time cost for transportation costs (\$)
$maxMAN$	maximum management cost (\$)
$maxCOST$	maximum total cost (\$)
$Mcost_{fi}$	military construction (MILCON) cost for facility type <i>f</i> at installation <i>i</i> (\$/SF)
$Rcost_{ir}$	MILCON cost for a new range <i>r</i> at installation <i>i</i> (\$/range)
$UPcost_{fi}$	cost to upgrade facilities type <i>f</i> at installation <i>i</i> (\$/SF)
$Vcost_{iu}$	variable cost if unit <i>u</i> is assigned to installation <i>i</i> (\$)
$CostSustain_{fi}$	cost to sustain existing facilities type <i>f</i> at <i>i</i> (\$/SF)
$CostNew_{fi}$	cost to sustain new facilities type <i>f</i> at <i>i</i> (\$/SF)
$TRcost_{iu}$	transportation cost for moving unit <i>u</i> to installation <i>i</i> (\$)

K.3 Range Data

$RANm_r$	maximum range days on a new range <i>r</i>
----------	--

<i>RANkcap_{ik}</i>	range capacity of type <i>k</i> at installation <i>i</i> (km ² Day)
<i>RANkreq_{ku}</i>	range required of type <i>k</i> for unit <i>u</i> (km ² Day)
<i>RANkshort_k</i>	existing range shortage for range type <i>k</i> (km ² Day)
<i>RANrcap_{ir}</i>	range capacity of type <i>r</i> at installation <i>i</i> (day)
<i>RANrreq_{ru}</i>	range required of type <i>r</i> for unit <i>u</i> (day)
<i>RANrshort_r</i>	existing range shortage for range type <i>r</i> (day)
<i>allowRNG_{ir}</i>	the starting range shortage allowed for <i>r</i> at installation <i>i</i> (day)
<i>allowRNG_{Sr}</i>	the starting range shortage allowed for <i>r</i> for set <i>S</i> (day)
<i>allowKM2_{ik}</i>	the starting km ² Days overage allowed for maneuver land <i>k</i> at installation <i>i</i> (km ² Day)
<i>allowKM2_{Sk}</i>	the starting km ² Days overage allowed for maneuver land <i>k</i> and set <i>S</i> (km ² Day)
<i>moreRNGshort_r</i>	multiplicative, range <i>r</i> , shortage for the Army (day)
<i>moreKM2short_k</i>	multiplicative, km ² Days, shortage for the Army (km ² day)
<i>ADDKM2_{Sk}</i>	additional shortage allowed for maneuver land <i>k</i> for set <i>S</i> (km ² Day)
<i>ADDRNG_{Sr}</i>	additional shortage allowed for range <i>r</i> and set <i>S</i> (day)
<i>mRNGshort</i>	the minimum range shortage before a range purchase (days)

K.4 Facility Data

<i>FACcap_{efi}</i>	facility capacity type <i>f</i> at installation <i>i</i> condition <i>c</i> (SF)
<i>FACreq_{fu}</i>	facility required of type <i>f</i> for unit <i>u</i> (SF)
<i>GREEN_{fi}</i>	green facility type <i>f</i> at installation <i>i</i> not used by currently stationed units (SF)
<i>OTHER_{fi}</i>	other facility type <i>f</i> at installation <i>i</i> not used by currently stationed units (SF)

K.5 Adjusted Present Value (APV) Factor Data

<i>APVBOS_{ss}</i>	APV for BOS costs for steady state stationing (years 7-20)
<i>APVBOS_{sq}</i>	APV for BOS costs for status quo stationing (years 1-6)
<i>APVBOS</i>	APV for BOS (years 1-20)
<i>APVMILCON</i>	APV for MILCON (years 1-20)
<i>APVMAINT_{ss}</i>	APV for maintenance for steady state stationing (years 7-20)
<i>APVMAINT</i>	APV for maintenance (years 1-20)
<i>APVManage</i>	APV for management (years 1-20)

Nonnegative Variables:

<i>usehvy_i</i>	percent of heavy maneuver land in use on installation <i>i</i>
<i>milcon_{fi}</i>	military construction of facility <i>f</i> at installation <i>i</i> (SF)
<i>upgrad_{fi}</i>	conversion of facility <i>f</i> SF in other condition to green condition at installation <i>i</i> (SF)
<i>range_{ir}</i>	shortage of range <i>r</i> at installation <i>i</i>
<i>agreen_{fi}</i>	green conditioned facilities made available by moves from facility type <i>f</i> at installation <i>I</i>

$erran_{ir}$ deviation for range type r at installation i (day)
 $ekran_{ik}$ deviation for range type k at installation i (km² Days)

Binary Variables:

$station_{iu}$ 1 if unit u is assigned to installation i and 0 otherwise
 $close_i$ 1 if installation i is closed and 0 if open
 $exit_{fi}$ 1 if units exit facility f at installation i

Objective: The objective function minimizes the net present value for all fixed and recurring costs over a given time period.

Objective:

Minimize Net Present Value

$$\begin{aligned}
 & APVBOS_{ss} \left(\sum_{i, u \in UA_i} Vcost_{iu} station_{iu} \right) + APVBOS_{sq} \left(\sum_{i, u \in IS_i} Vcost_{iu} station_{iu} + \sum_i Fcost_i close_i \right) \\
 & + APVBOS \left(\sum_i Fcost_i (1 - close_i) \right) + APVMILCON \left(\begin{array}{l} \sum_f Mcost_f milcon_f \\ + \sum_f UPcost_f upgrad_f \\ + \sum_{ir \in N} Rcost_r range_r \end{array} \right) \\
 & + APVMAINT_{ss} \sum_f (CostSustain_f milcon_f) + APVMAINT \sum_{fc} (CostSustain_f FACcap_{cf} (1 - close_i)) \\
 & + APVMAINT_{sq} \sum_{fc} (CostSustain_f FACcap_{cf} close_i) + APVMOVE \sum_{i, u \in UA_i \text{ and } u \in IS_i} (TRcost_{iu} station_{iu}) \\
 & + APVManage \left(\begin{array}{l} \sum_i ManCostC_i close_i \\ + \sum_u ManCostM_u station_{iu} \end{array} \right)
 \end{aligned}$$

Constraint Discussion:

All stationing must adhere to the Army Stationing Strategy and force structure requirements. The Army Stationing Strategy provides general operational requirements and stationing guidance for each installation category. The Strategy limits or directs certain possibilities, while the force structure drives the unit composition and thus land, range, and facility requirements.

One set of constraints forces the model to provide all of a unit's required facilities in a certain condition. For example, if a unit moves from installation A to B, then these constraints ensure installation B has the required facilities for the unit in green-rated condition. A second set

ensures training land and range requirements are met, while a third enforces stationing requirements. The final set addresses costs.

K.6 Constraint Set #1. Facilities

The first five equations ensure adequate facilities for units; existing units use "Green" then "Other" facilities, and newly assigned units use available Green, Other upgraded to green condition, and new MILCON.

(K.1) Ensure sufficient existing facility square feet at each installation or satisfy the shortage with MILCON.

$$\sum_{u \in UA_i} FACreq_{fu} station_{iu} \leq \sum_c FACcap_{cf} + milcon_{fi} \quad \forall f, i \quad (K.1)$$

(K.2) Ensure sufficient green category facility square feet at each installation for units moved to the installation or satisfy the shortage by upgrading or MILCON.

$$\sum_{u \in UA_i \text{ and } u \in IS_i} FACreq_{fu} station_{iu} \leq agreeen_{fi} + GREEN_{fi} + milcon_{fi} + upgrad_{fi} \quad \forall f, i \quad (K.2)$$

(K.3)-(K.5) Can only upgrade unused other category facility square feet at each installation or the other other/green facilities vacated by a unit stationed at a different installation.

$$agreeen_{fi} + upgrad_{fi} \leq OTHER_{fi} + \sum_{u \in IS_i, i' \neq i \text{ and } i' \in CA_u} FACreq_{uf} station_{i'u} \quad \forall f, i \quad (K.3)$$

$$FACcap_{\text{"other"}_{fi}} exit_{fi} \leq upgrad_{fi} \quad \forall f, i \quad (K.4)$$

$$agreeen_{fi} \leq FACcap_{\text{"green"}_{fi}} exit_{fi} \quad \forall f, i \quad (K.5)$$

K.7 Constraint Set #2. Training

The second set of constraints is for ranges and training lands. OSAF ensures shortages in km²Days and range-days do not increase due to stationing of units. For example, if a unit requires 100 days on a zero range, then OSAF ensures the range-days are available on the installation, or OSAF accounts for the needed MILCON to obtain the range-days on the installation to make up for shortages.

These seven equations constrain the stationing alternative's shortage of training lands and ranges.

(K.6) to (K.7) Limits realignment so it does not produce any additional training requirement shortfall outside of allowable limits.

$$\sum_{i \in S, u \in UA_i} RANrreq_{ru} station_{iu} \leq \sum_{i \in S} (RANrcap_{ir} + erran_{ir}) \quad \forall r \quad (K.6)$$

$$\sum_{u \in UA_i} RANrreq_{ru} station_{iu} \leq RANrcap_{ir} + erran_{ir} \quad \forall i \notin S, r \quad (K.7)$$

(K.8) to (K.9) The allowable shortfall Army wide has to be less than the range shortfall prior to any realignment plus a possible percentage over the original shortage.

$$\sum_{i \in S} erran_{ir} \leq moreRNGshort_r RANrshort_r \quad \forall r \quad (K.8)$$

$$\sum_{i \in S} ekran_{ik} \leq moreKM2short_k RANkshort_k \quad \forall k \quad (K.9)$$

(K.10) New ranges must be built to satisfy any shortfall for a subset of range types; however, a new range does not have to be built until a minimum shortage is attained.

$$erran_{ir} \leq rngshort + RANm_r range_{ir} \quad \forall i, r \in N \quad (K.10)$$

(K.11) to (K.12) These equations allow an overage for the set S beyond the starting range or km²day shortfall.

$$\sum_{i \in S} erran_{ir} \leq allowRNG_{S_r} + ADDRNG_{S_r} \quad \forall r \quad (K.11)$$

$$\sum_{i \in S} ekran_{ik} \leq allowKM2_{S_k} + ADDKM2_{S_k} \quad \forall k \quad (K.12)$$

(K.13) to (K.14) The allowable shortfall for an installation has to be less than the range or km²day shortfall prior to any realignment plus a possible addition over the original shortage (K.8 and K.9 were Army wide).

$$erran_{ir} \leq allowRNG_{ir} + ADDRNG_{ir} \quad \forall i \notin S, r \quad (K.13)$$

$$ekran_{ik} \leq allowKM2_{ik} + ADDKM2_{ik} \quad \forall i \notin S, k \quad (K.14)$$

(K.15) to (K.16) These equations ensure the light maneuver requirement can be met by the heavy maneuver capacity if heavy capacity is available and has not been fully used by heavy requirements.

$$\sum_{u \in UA_i} RANkreq_{iu}{}^{HV_MNVR} station_{iu} \leq RANkcap_{i}{}^{HV_MNVR} usehvy_i + ekran_{i}{}^{HV_MNVR} \quad \forall i \notin S, RANkcap_{i}{}^{HV_MNVR} \neq 0 \quad (K.15)$$

$$\sum_{u \in UA_i} RANKreq_{i, "LT_MNVR"} station_{iu} \leq RANKcap_{i, "HV_MNVR"} (1 - usehvy_i) + RANKcap_{i, "LT_MNVR"} + ekran_{i, "LT_MNVR"} \quad \forall i \notin S \quad (K.16)$$

K.8 Constraint Set #3. Stationing Requirements

The third set of constraints is stationing restrictions or special stationing considerations (e.g., do not move the Fort Leavenworth prison complex). These rules are developing over time as we use OSAF and discuss results with the HQDA G3 and the ACSIM. OSAF can determine the cost of each stationing restriction and thus indicate how much the Army should be willing to pay to complete tasks that would eliminate the need for a restriction.

(K.17) Each unit must be stationed on an installation.

$$\sum_{i \in CA_u} station_{iu} = 1 \quad \forall u \quad (K.17)$$

(K.18) Units are not stationed on a closed installation.

$$station_{iu} \leq 1 - close_i \quad \forall i \notin FIX, u \in UA_i \quad (K.18)$$

(K.19) Units of type "DOD" are moved only after all other units on the installation are moved and the installation is closed.

$$\sum_{i \in CA_u \text{ and } u \in IS_i} station_{iu} \leq \sum_{i \in IS_i} close_i \quad \forall u \in UT_{DOD} \quad (K.19)$$

K.9 Constraint Set #4. One-time Costs

We limit the total funds available for one-time or implementation costs in the last set of constraints. For example, the total implementation cost could be \$1B. Or, we can limit implementation costs at the category level: \$200M for MILCON and \$2M for program management.

(K.20) to (K.23) respectively limit MILCON, movement, management, and total one-time cost.

$$\sum_{f_i} Mcost_{f_i} milcon_{f_i} + \sum_{i \in N} Rcost_{i_r} range_{i_r} + \sum_{f_i} UPcost_{f_i} upgrad_{f_i} \leq maxMILCON \quad (K.20)$$

$$\sum_{i \in IS_i} TRcosts_{iu} station_{iu} \leq maxMOVE \quad (K.21)$$

$$\sum_{iu \in IS_i} ManCostM_u station_{iu} + \sum_i ManCostC_i close_i \leq maxMAN \quad (K.22)$$

$$\sum_{fj} Mcost_{fj} milcon_{fj} + \sum_{ir \in N} Rcost_{ir} range_{ir} + \sum_{fj} UPcost_{fj} upgrad_{fj} + \sum_{iu \in IS_i} (TRcosts_{iu} + ManCostM_u) station_{iu} + \sum_i ManCostC_i close_i \leq maxCOST \quad (K.23)$$

GLOSSARY

AAA	Army Audit Agency
AAPs	Army Ammunition Plant
AEC	Army Environment Center
AFB	Air Force Base
AIBP	Army Industrial Base Program
AMC	Army Materiel Command
AMSAA	Army Material Systems Analysis Activity
APV	Adjusted Present Value
AR	Army Regulation
ARMs	Armament Retooling and Manufacturing Support
ASA	American Society of Appraisers
ASD	Assistant Secretary of Defense
AVLIS	automatic vapor laser isotope separation
BENS	Business Executives for National Security
BRAC	Base Realignment and Closure
C&C	Command and Control
CAA	Center for Army Analysis
CAS	Cost Accounting Standards
CBO	Congressional Budget Office
CEO	Chief Executive Officer
CHAMPUS	Civilian Health and Medical Program of the Unified Service
COBRA	Cost of Base Realignment Action Model
COE	Corps of Engineers
CONUS	Continental United States
CSE	client server environment
DCF	discounted cash flow
DIA	Defense Intelligence Agency
DLA	Defense Logistics Agency
DMA	Defense military activity
DOD	Department of Defense
DOE	Department of Energy

DOJ	Department of Justice
DPG	Defense Planning Guidance
DWCF	Defense Working Capital Fund
EBIT	Earnings before interest and tax
EBITDA	Earnings before interest and tax, depreciation and amortization
EC	excess capacity
ENT	Ear-nose-throat
FAR	Federal Acquisition Regulation
FFRDCs	Federally Funded Research and Development Centers
FGC	Federal government corporation
FSLIC	Federal Savings Loan Insurance Corporation
FY	fiscal year
GAAP	generally accepted accounting principles
GAO	General Accounting Office
GOCO	Government-owned, contractor-operated
GOGO	Government-owned, Government-operated
GPS	global positioning system
GSEs	Government Sponsored Enterprises
GSIE	Ground Systems Industrial Enterprise
GYN	Gynecology
HQDA	Headquarter, Department of the Army
IPO	initial public offering
IRS	Internal Revenue Service
MAC	Munitions and Armaments Command
MACOMs	major Army commands
MILCON	military construction
MILDEP	Military Department
MOGC	Mixed ownership government corporation
MOM	Measures of Merit
MOUs	memorandums of understanding
MTF	medical treatment facility

MV	Military Value
NAFB	Newark Air Force Base
NAS	Naval Audit Service
NASA	Aeronautical and Space Administration
NCCC	National Civilian Community Corps
NCSA	Corporation for National and Community Service
NPV	net present value
NSIAD	National Security and International Affairs Division
OECD	Office of Environmental Compliance and Documentation
OMA	operations and maintenance, Army
OMB	Office of Management and Budget
OMS	Appendix G
OSC	Operation Support Command
OSD	Office of the Secretary of Defense
OSE	Operational Support Equipment
OSHA	Occupational Safety and Health Administration
P/E	price/earnings
PBSP	Production Base Support Program
PC	private corporation
PIP	privatization in place
POM	program objective memorandum
PPP	public private partnership
PwC	PriewaterhouseCoopers
R&D	research and development
RIF	reduction in force
RPLANS	Real Property Planning and Analysis System
RSC	Regional Support Command
RSVP	Retired and Senior Volunteer Program
RTC	Report to Congress
SDC	Security Data Cooperation
SEC	Securities and Exchange Commission
SECDEF	Secretary of Defense

SMCA	Single Management for Conventional Ammunition
T&E	test and evaluation
TAA	Total Army Analysis
TABS	Total Army Basing Study
TAMCO	Tank-Automotive and Armaments Command
TCE	Transaction Cost Economics
TRADOC	US Army Training and Doctrine Command
TVA	Tennessee Valley Authority
UEE	Uranium Enrichment Enterprise
UK	United Kingdom
URCM	Unit Relocation Cost Model
USC	United States Code
USEC	United States Enrichment Corporation
UXO	Unexploded Ordnance
VISTA	VISTA Information Technologies Inc.
WACC	weighted average cost of capital
WOGC	Wholly owned government corporation